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ON

THE NATURE OF FLUTTER AND FIBRILLATION OF THE AURICLE.

BY

THOMAS LEWIS, M.D., F.R.C.P., F.R.S.,

PHYSICIAN OF THE STAFF OF THE MEDICAL RESEARCH COUNCIL; PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL, LONDON; HONORARY CONSULTING PHYSICIAN TO THE MINISTRY OF PENSIONS.

LECTURE I.—AURICULAR FLUTTER.*

MR. PRESIDENT,—May I first thank you, Sir, and the College which you represent for the honour you do me in appointing me to this lectureship—a lectureship founded to promote physiological research by observation and experiment and to encourage the application of physiological knowledge to the prevention and cure of disease; a lectureship founded to commemorate a great physiologist, and founded by a physician whose work in this very field is known to and admired by all of us.

The request which you have made, and which I have gratefully accepted, has come at a moment which to me is opportune. This lectureship carries with it a responsibility of no little weight; no lectureship could possess a more serious or far-seeing purpose than the welding together of Physiology and Experimental Medicine. I have said that for me the moment is opportune, for it comes at a time when observations in which I have been deeply interested for many years have grown to a state of some maturity. The observations of which I shall speak are essentially of a physiological kind; the investigations are reaching a point when their applicability to the practice of medicine cannot long remain in doubt. The subject chosen is the only subject which I could choose for these lectures—the work upon which my collaborators and myself have now been engaged for many years, a subject upon which we have been almost exclusively engaged during the past two years. These researches have comprised an attempt to solve the meaning of certain grave disturbances of the human heart beat, and it is my good fortune to be able to say to-day that we are at the end of this task.

It is a long story, and, if it is to be told intelligibly in these two lectures, it must be told connectedly. With your permission I will try and place before you the leading facts and arguments; I will narrate these, not in their historical order, but in the order most suited to my purpose, namely, to show you where our knowledge of auricular flutter and auricular fibrillation now stands. If I am to do this in the time at our disposal I shall be unable to bring before you anything but a small part of the evidence upon which our conclusions rest. Assuring you now that I shall draw no conclusion lightly nor without most closely weighing all the evidence, I must, from the force of circumstances, ask you to take much for granted. In another direction, also, and for similar reasons, I crave indulgence. It will be impossible for me suitably to bring into the compass of these lectures the names of many contributors to this field of knowledge. This historical aspect has been dealt with recently and fully in another place. In so far as I have myself contributed during the last two years, I have contributed with my immediate collaborators; we have worked as a team under the auspices of the Medical Research Council; the names of my co-workers are Dr. Thomas Cotton and Dr. A. N. Drury of this country; Dr. H. S. Feil, Dr. W. D. Stroud, and Dr. H. A. Bulger of the United States, and Dr. C. C. Iliescu of Bucharest. From these introductory remarks I may proceed to my subject.

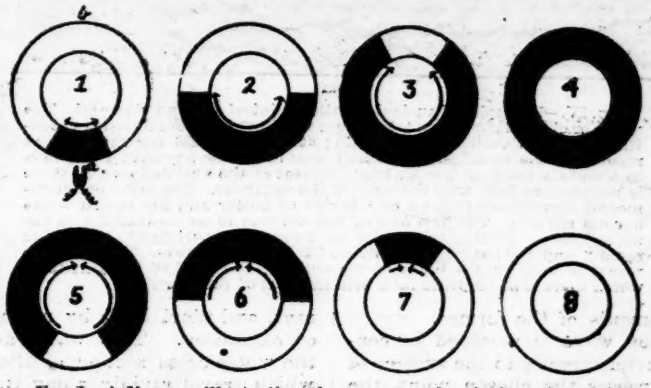

FIG. I.—A diagram illustrating the progress of a single wave passing through a ring of muscle as a result of stimulating it at *a*. The black portion of the ring represents the refractory state, and the figure shows its progress through the ring till it involves the whole (*4*); later the figure shows its subsidence.

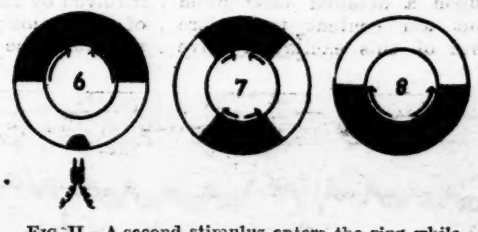

FIG. II.—A second stimulus enters the ring while it is in the condition shown in Fig. I, *6*. While the first wave is subsiding the second wave spreads.

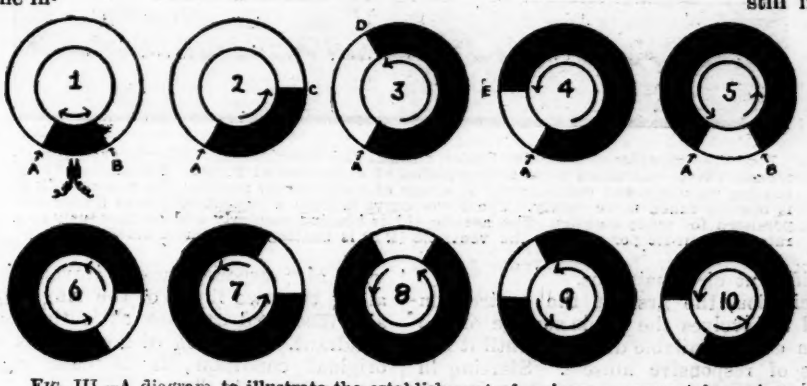

FIG. III.—A diagram to illustrate the establishment of a circus movement in a ring of muscle. The ring is stimulated in its lower quadrant and the wave spreads to *A* and to *B*. At *A* it is blocked, but from *B* it continues around the ring. When it arrives at *E* (*6*) the refractory state at *A* is passing, and so the wave continues to travel around the circle (*5–10*).

SOME NORMAL FEATURES OF THE CONTRACTION PROCESS.

Let me first briefly describe the relevant events when normal heart muscle contracts in response to a natural or artificial stimulus. The first event of which we possess knowledge is that it passes into what is termed the *state of excitation*. By this we mean that the muscle develops a charge, just as a battery develops a charge, and that currents flow through it and the surrounding tissues. The charge is such that the active muscle becomes relatively negative to that which is still inactive, in the sense that the zinc terminal of a copper-zinc battery is negative to the copper. These electrical changes, associated with muscular activity, are of sufficient magnitude to be recorded by means of sensitive instruments, and they yield the pictures now spoken of as electrocardiograms. The electrical change in the muscle is the immediate precursor of contraction:† first the muscle becomes excited (or charged), secondly it contracts. The two events are separated in the mammalian auricle by a small time interval of three-hundredths of a second or less.

Now the process of excitation is not simultaneous in all parts of the muscle; it begins at the point first stimulated

* Delivered before the Royal College of Physicians of London, April 12th, 1921.

† That the electrical change precedes the contraction is at the moment the accepted view, though the interval is acknowledged to be very short.

and spreads from this point. Stimulate a point in the centre of a sheet of muscle and the wave spreads concentrically, as does the ripple on the surface of a pond into which a pebble is thrown. It is conducted from one muscle element to the next as a wave, which is termed the *wave of excitation*. Similarly with the contraction process itself; this also spreads as a wave which accurately follows the course travelled by the wave of excitation. It may be likened to the second ripple on the pond. For our present purposes and to simplify the conception, we may regard these waves as one, signalling itself as it proceeds, first electrically (first ripple), then mechanically (second ripple). When, therefore, I speak of the wave of excitation in the auricle and of the course it takes, you may picture in your minds the wave of contraction without fear of serious misconception. Nevertheless, I should, perhaps, be guilty of inaccuracy if I spoke of the wave of contraction, because our studies have been mainly, though not exclusively, directed to the wave of excitation; for movements of the latter are to be recorded with far greater accuracy than movements of the former.

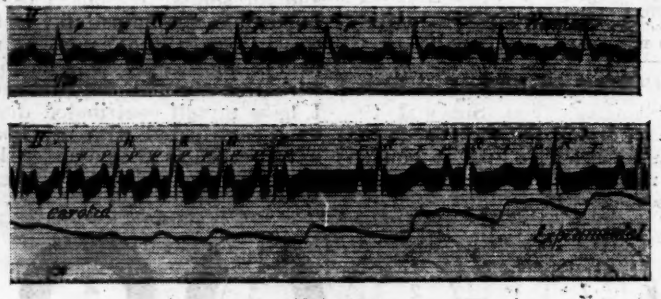

FIG. IV.—Examples of auricular flutter, clinical and experimental. The upper or clinical curve was taken from a patient in whom flutter was continuous. The auricle (*P*) is beating at a rate of 228 per minute and regularly; the ventricle (*R*) at half that rate. The ventricle responds to alternate beats of the auricle; the beat of the auricle to which there is no response falls with the beat of the ventricle. The lower or experimental curve shows the end of a period of flutter and the return of the normal rhythm. The *first half* of this curve is to be compared with the upper curve. During the period of flutter the auricle (*P*) is beating rapidly and regularly; the ventricle (*R*) at half the rate. The ventricle responds to alternate beats of the auricle; the beat of the auricle to which there is no response falls with the beat of the ventricle.

Movement of the excitation wave is recorded by connecting a sensitive galvanometer directly to the surface of the muscle. As the wave passes the chosen point, the galvanometer yields a sharp deflection, and this may be photographed and accurately timed against the events in some other region of the muscle. I do not propose in the present lectures to enter upon a detailed description of this delicate method, but am content to declare that we can time the arrival of this excitation wave at any point of the muscle surface with such accuracy that the error is no more, usually it is less, than one thousandth of a second; that by using two or more recording instruments simultaneously we can trace out the paths taken by waves of excitation as they travel through the muscle; and that we can estimate very accurately the time lost in the passage from point to point in different circumstances.

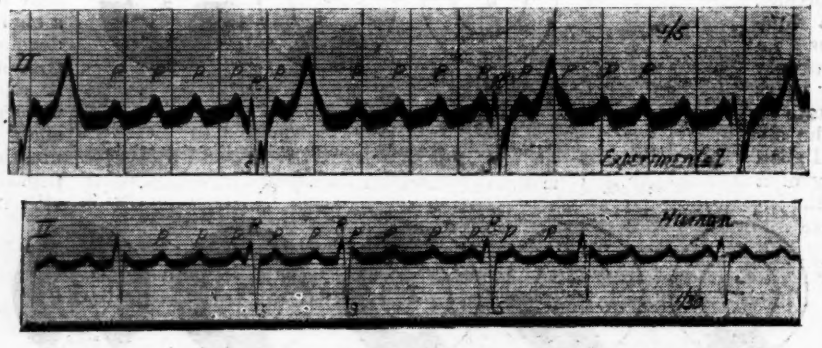

FIG. V.—Examples of auricular flutter, clinical and experimental. The upper or experimental curve was taken from a long period of experimental flutter. The auricle (*P*) is beating regularly and continuously at a rate of about 350 per minute; the ventricle (*R S*) is beating much more slowly. The lower curve is from a patient in whom flutter had persisted for many months. The auricle (*P*) is beating regularly and continuously at a rate of about 270 per minute; the ventricle (*R S*) is beating much more slowly.

The wave of excitation, the first of the contraction process, travels until it involves the whole surface of the muscle; it travels in every available direction until it has exhausted all tracts of responsive muscle. Starting in the centre it travels until it comes to the boundaries; there it ends, for at the boundary it finds no further tracts of responsive muscle through which to pass. Appropriately you may liken the spread of the excitation wave to the flame of a prairie fire. It spreads concentrically wherever it finds inflammable material; it cannot return over its scorched wake, neither can it proceed when it reaches the bounds of the dried acres. The wave of excitation leaves the muscle over which it passes in a non-inflammable, or, as it is termed, *refractory state*, and that muscle is incapable of carrying a second wave of excitation until its original inflammable state is restored. The period during which this restoration is effected is called the *refractory period* of the muscle; in the natural beating auricle of the dog it lasts from a fifth to a tenth of a second; its duration is approximately the same as the duration of the contracted state of the muscle.

From these preliminary observations I pass to what may be termed the "ring experiment."

THE RING EXPERIMENT.

The ring experiment was first performed by Mayer in 1908; he used the contractile bell of the jelly-fish and subsequently he utilized rings of muscle cut from the ventricles of turtles. His experiments were repeated and amplified by Mines in 1913 upon rings of muscle cut from the auricles of teleostean fishes. In 1914 both Mines and Garrey reported that they had obtained similar effects in rings of muscle cut from the dog's ventricle.

The experiment from our present standpoint is fundamental; I shall describe it, therefore, in some detail.

Suppose that we stimulate a ring of muscle, such as is depicted in Fig. I, at *a* the centre point of its lowest quadrant, and start in it by means of a single shock a wave of excitation. This wave, as soon as it has involved the whole cross section of the ring, develops two crests, which travel rapidly along the two limbs of the circle until, as shown in the serial diagrams (Fig. I, *1–4*), they meet at point *b*, the centre point of the highest quadrant. At the instant the crests meet the whole ring has become involved by the wave; the whole has passed into a state of excitation; it has all become "refractory." When, therefore, the two crests meet at point *b*, movement is brought to an end; like two waves of flame, two waves of excitation meeting do not override, each crest forms an impassable barrier to the other. The ring of muscle remains in this state of excitation for a period and then recovers. It recovers in the order in which it has become involved, it begins to be "responsive" in its lowest quadrant (at *a*) first of all. The wave of "responsiveness" travels similarly as two crests along the two limbs of the ring (Fig. I, *5–8*) until they also meet and coalesce at *b*, the centre of the highest quadrant. The ring of muscle has now returned to its original condition; it is once again wholly in the responsive state.

Such is the series of events when the muscle of the ring responds to a single stimulus. If the ring is stimulated by means of slow rhythmic shocks, each shock awakens a like series of events, providing that the intervals between the shocks are amply sufficient to permit recovery. Each stimulus yields a double-crested wave of response, which ultimately involves the whole ring. It will be evident that, if in rhythmic stimulation the second shock falls upon the ring while it is in the condition represented by Fig. I, *6*, a fresh wave may be propagated at *a* before the response to the first shock has subsided at *b*. In such circumstances two waves will

be moving through the ring at one time, as depicted in Fig. II, *6–8*.

We come now to a different form of reaction; it is that which especially concerns us. It happens when the rate of rhythmic stimulation is raised to a critical point—namely, when the intervals between the shocks are such that each falls on the muscle at a time when responsiveness in this muscle has not wholly recovered. In such circumstances the wave propagated by stimulation may be unable to travel with its usual freedom in all directions. From time to time it is found that a wave propagated from the point of stimulation can pass in one direction only. It starts well enough, perhaps, and reaches two points of the ring *A* and *B* (Fig. III); but at *A* it finds the muscle still insufficiently responsive, while at *B* recovery is more advanced. At *A* progress comes to an end, while at *B* the crest continues to move. Suppose that at this instant stimuli are withdrawn; the conditions are peculiar. Instead of two crests, advancing to meet and interfere,

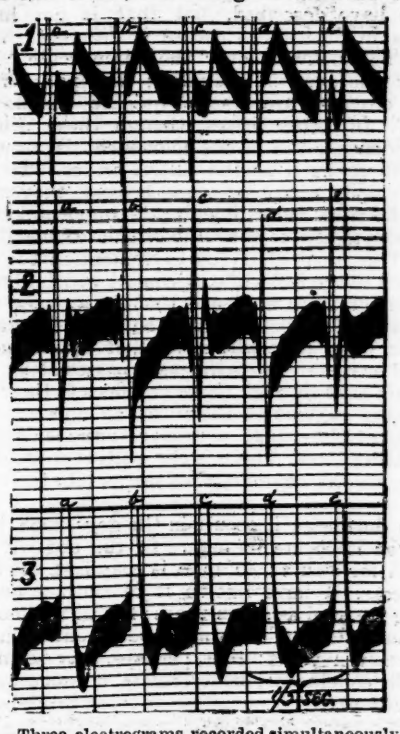

FIG. VI.—Three electrograms recorded simultaneously from the taenia terminalis of a dog while the auricle was fluttering. The top curve (1) was taken from the inferior caval, the bottom curve (3) from the superior caval, and the centre curve (2) from the mid region of the taenia. The record corresponds to five cycles of flutter (*a–e*). As each excitation wave passes, it signals itself by means of a sharp upward movement of the three recorders. Recorder *1* moves first, recorder *2* a fraction of a second later, and recorder *3* a fraction of a second later still. The order of excitation is 1, 2, and 3; the wave is passing up the taenia.

there is now but one, and it is free to circulate, for as it comes to each new segment (*C*, *D*, *E*) of the ring it finds this segment excitable (Fig. III, *2* to *4*). The single crested wave consequently progresses around the whole ring, and, coming back to its starting point, finds that this muscle also has recovered (Fig. III, *5*); it proceeds so long as the conditions remain unaltered; it continues its course as a circulating wave which has no ending (Fig. III, *6* to *10*). Thus it has been shown that, the conditions being nicely controlled, the last stimulus of a series may originate, not a single response of the ring, but an unlimited series of responses. Mines saw the wave continue to circulate for minutes, Mayer saw it continue for very many hours; this is what is meant by circus movement; it is constituted by a wave of response which travels continuously along a re-entrant path of muscle.

AURICULAR FLUTTER.

We may now examine a condition of the mammalian auricle, to-day called auricular flutter. Flutter as we now understand it was first clearly described in a patient by Hertz and Goodhart in 1909; they studied their case by means of venous curves, showing the auricle to be beating continuously and regularly at a rate of 234 per minute. Their description was quickly followed by the more ample records of Jolly and Ritchie, and of other writers. The rate of the auricular beating in flutter is from 230 to 350 per minute; the action of this chamber is remarkable, not only for its high rate, but for its regularity. It is to be recognized with the greatest certainty in electrocardiograms, of which examples are shown in Figs. IV and V. The condition is also remarkable because it continues uninterruptedly for long periods of time. Sometimes it may occur in short paroxysms, more usually it comes to stay for months or years. Its nature until quite recently has remained altogether mysterious, though very numerous observations have indicated its close affinity to the condition called fibrillation. Thus flutter is often converted into fibrillation by the administration of digitalis. There have been few satisfactory records of a similar experimental condition. The term "flutter" was used by McWilliam as early as 1887; that was in the days when the two conditions flutter and fibrillation were not definitely

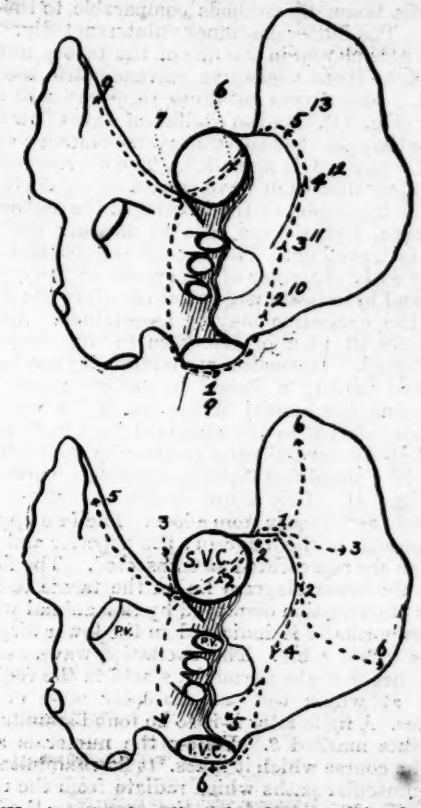

FIG. VII.—A natural outline of a dog's auricle, showing the paths of the excitation wave (broken lines) while the heart beat naturally (lower diagram) and during flutter (upper diagram). The numbers indicate the approximate order in which various parts of the musculature received the excitation wave.

distinguished. The first electrocardiograms of experimental flutter—and these curves are alone really distinctive—have been obtained during the past few years. We are now certain that a condition identical with that found clinically may be produced experimentally in the dog's auricle; this we have been taught by clinical and experimental electrocardiography.

In investigating disease there is one well known and most fruitful method of approach: it is to produce in animals a condition identical with that seen in the patient. When this has been accomplished it becomes possible to inquire into the precise nature of the disturbance. If and when that knowledge is obtained, we are in a position to consider rational plans of treatment. As I have related, in the case of flutter of the auricle, the first step has been taken. A continuous and rapid action of the dog's auricle can be produced in several ways, notably by rhythmically stimulating the organ with induction shocks at a rate of 300 to 600 per minute. The auricle is driven rhythmically and rapidly for a few seconds, and the stimuli are then abruptly withdrawn. In a certain proportion of such experiments a rapid action of the auricle continues after stimulation has ceased. The rate of action is not usually that of the rhythmic shocks which provoked

it; it is usually less. For the moment our chief concern is not the method of producing this rapid and continuous action, but its nature. Its nature is variable, but amongst the after-effects of stimulation a condition identical with clinical flutter is seen from time to time. It is not every auricle which is predisposed to flutter; it is not every stimulation which will invoke flutter in the predisposed organ. That, however, is immaterial, providing that we can produce it, and can be certain when it is produced that it is identical with the clinical condition. The electrical curves, clinical and experimental (Figs. IV and V) leave us with no doubt on this subject; these curves, so delicately analytical, place the conclusion beyond question.

Having produced experimental flutter, we proceed to investigate its nature. The method of investigation consists of mapping out the path taken by the excitation wave while flutter is in progress. A single illustration of method will perhaps suffice. The auricle of a dog has been forced into a state of flutter, as ascertained by electrocardiograms taken by methods comparable to those used clinically. The flutter continues uninterruptedly. Three points are now chosen in the line of the taenia terminalis, and to each of these a sensitive galvanometric recorder is connected. The curves of these recorders write simultaneously (Fig. VI). As the excitation waves flow through the muscle they pass beneath the several contact points, and at each the passage is signalled. The curves, considered together, show that each wave is passing regularly up the taenia from the region of the inferior to the region of the superior cava, and we are able to measure the rate at which it is travelling. This record is published to illustrate the orderly character of the events as the cycles are repeated, and to indicate with what certainty the direction taken by the excitation may be ascertained. Actually a slightly different plan of campaign to that described is usually adopted. It consists of maintaining one lead as a standard and moving a second to various points of the auricle, timing the arrival of the excitation wave at its several parts relative to the standard lead, and finally of its arrival at the several parts relative to each other. To exemplify in a simplified fashion a complete experiment I may use Fig. VII. This figure shows the natural outline of the auricle as it is seen from above. The two appendices project upwards in the diagram; the superior and inferior venae cavae are represented as transected. The figures *1*, *2* and *4* in the lower diagram lie on the taenia terminalis. The order of excitation displayed by this animal while the heart beats normally is indicated in the lower diagram by the figures *1*, *2*, *3*, *4*, etc. The excitation wave, as is usual when the heart beats normally, starts in the region of *1*, the point at which the sino-auricular node or "pacemaker" lies. A little later it is to be found simultaneously at the points marked *2*. Follow the numerals and you perceive the course which it takes. It flows simultaneously along the muscular paths which radiate from the region of the node. Thus, it flows down the taenia to the inferior cava; it flows from the base to the tip of the right appendix; it flows through the intra-auricular band to the left auricle, and, still flying from its point of origin, traverses the left appendix from its base to its tip. The wave is not visible as a wave; it travels too fast for that; the whole process of spread occupies the twentieth part of a second.

In the top diagram of the figure is the essential part of the map for the same auricle in a state of rapid flutter. The order of excitation is quite different. The wave is first traced at the inferior vena cava (*1*) and it passes up the whole length of the taenia (*2*, *3*, *4*, and *5*). Reaching the top of the taenia it moves around the superior cava and flows through the intra-auricular band (*6* and *7*) to reach the left auricle. It reaches the left appendix (*9*), and at the same instant a wave is timed to emerge from the inferior vena cava (*9*). The question which at once arises is whether this second wave, emerging from the inferior cava and repeating the course (*10*, *11*, *12*, *13*, etc.) of the first wave, is a new wave or whether it is the continuation of the old one. Is there a succession of regular waves, each arising *de novo* in the inferior cava, or is there a single circulating wave? This question is answered by two considerations. If we propagate a wave artificially from the inferior cava, this spreads equal distances in equal times; it arrives at the two points *4* and *7* simultaneously. That is not the case in flutter; here it passes through point *4* to reach point *7*. But the decisive argument is found in the time relation of the wave; knowing the rate at which it travels along its path (*1*, *2*, *3*, *4*, *5*, *6*, and *7*) we can calculate how long it should take to move from *7* to *9*, and can compare this calculated time interval with the actual interval observed; these are found to be the same within an inconspicuous margin of error. There can be no doubt, then, that we are dealing with a wave which circulates. It circulates in this experiment around a natural ring of muscle formed by the orifices of the two venae cavae. Looked at from above, the movement is in the opposite direction to the hands of a clock. In this instance it completed one circuit in 0.16 of a second; it completed therefore 380 circuits in one minute, and that was the rate at which the auricle beat.

The experiment which I have described is one of several, but it will suffice to illustrate the kind of evidence we possess of circus movement in the auricle. Flutter consists essentially of a continuously circulating wave. The path which this central or re-entrant wave usually takes is the one I have described, but that is not invariable. Sometimes in flutter the course is different; thus, the flow may be clockwise over the same route. In other cases only one cava is encircled; the path is shorter, and the circuits are more quickly completed consequently. In other cases, though these are not so clearly evidenced, the circus movement is around other natural orifices, such as the mitral orifice. These variations are chiefly of consequence because they render the experimental work more difficult; the important conclusion is that the wave can be shown to circulate when the auricle flutters. The proof of circus movement in the auricle is not confined to the class of experiment which I have cited; there is much more evidence that I can now give you; taken as a whole I believe it to be quite conclusive.

Now the wave as a whole is not, of course, confined to the central or re-entrant path; as it passes along this path offshoots are sent through the appendices to their tips, and into all other regions of the auricular muscle. Thus the movements of the whole auricular tissue is controlled by the circulating wave. There is the central or mother-wave, and there are its centrifugal offshoots into the remaining tissue.

Such is flutter as it occurs in the dog; such, therefore, is flutter as it occurs in man. In the dog we may see flutter last for hours; in man it may last, not for hours, but for years. I have known it to continue unceasingly for as long a period as seven years; for all we know it may continue even longer. A single wave continuously circulating for seven years: that, perhaps, may seem to be a remarkable conclusion; nevertheless, it is one we are now bound to accept.

THE FACTORS CONTROLLING FLUTTER.

We have seen that a condition comparable to clinical flutter may be produced in experiment; we have seen that when this experimental flutter is investigated it proves to consist essentially of a circulating wave. We may next consider the precise factors which maintain this circus movement. Refer back to the diagrams of the ring experiment and it will be clear that three factors are involved. They are:

1. The length of the central path.
2. The rate at which the wave travels.
3. The duration of the effective refractory period.

It must be evident that if the wave is to continue circulating a gap must exist between the crest of its advance and the wake of its retreat. As the crest travels it must always find the muscle which it enters in the responsive state. If for any reason the gap becomes closed, the wave will proceed no longer and the rapid action of the auricle will cease. The three factors named, and these alone, control the length of the gap. The duration of the refractory period at any given point must always be less than the time spent by the travelling wave in completing its circuit; this circulation time depends on the length of the path and the rate of travel. Now the rate of travel from point to point in the dog's auricle beating normally is approximately 1,000 mm. per second and the length of the refractory period at normal heart rates is approximately 0.15 to 0.2 of a second. In 0.15 to 0.2 of a second the wave will travel through 150 to 200 millimetres of muscle. On the basis of

these values a circus movement could not establish itself in a ring of muscle of less than 150 to 200 millimetres circumference. But it is known that much smaller circuits than these become established. What is the reason? The reason is that when the auricle flutters, the refractory period is reduced; also the rate of travel is usually reduced. These reductions both occur in response to an increased rate of beating such as prevails in flutter. Both changes facilitate the establishment of relatively short circus movements. The precise relations of the three controlling factors have now received close investigation. They are variable in different circumstances, but may be illustrated by a type experiment. A dog's auricle is fluttering at a rate of 500 per minute. Each circuit is completed in 0.12 of a second. The circuit has a length of 60 millimetres. The rate of travel is not 1,000 millimetres per second, but 500 millimetres per second. The rate of travel is but one-half the natural rate; that is so because the rate of beating is so high that the muscle is hard put to it to conduct the impulses. The length of the effective refractory period is not 0.20 but 0.10 of a second; it has become reduced with the rise of heart rate. The cycle is divided into two parts, a refractory phase of a tenth of a second, a responsive phase of a fiftieth of a second. The crest of the wave is constantly but a fiftieth of a second behind its own wake; it travels behind it at a distance of only 10 millimetres. We have direct and conclusive evidence that these figures may be taken as usually representative of the gap which exists; it is a minute gap, yet upon its existence the continued progress of the wave absolutely depends. To the question of this all-important gap I shall return at a later stage; it is a gap which will command the attention of many workers in the near future, for upon our power to influence its length, our success in treating flutter and, as we shall see, the closely allied condition fibrillation, will very largely depend. If by any means we could close that gap we could bring flutter to an abrupt termination.

CARCINOMA OF THE LARGE INTESTINE.*

BY

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THE treatment of cases of carcinoma of the large intestine is difficult. Most patients are fond of procrastination, especially in conditions where an operation enters into consideration. Time is lost with all sorts of examinations and investigations. *X*-ray photographs after bismuth meals, examinations and analyses of faeces, of vomit and of urine, and inspection with sigmoidoscopes often fail to reveal the early stages of carcinoma of the large intestine, which could be found if an exploratory examination were performed. I do not deprecate these examinations. They are all links in the chain, but they should neither be spread over too long a period nor have too much weight attached to them. Multitudinous drugs are swallowed; some of them give relief by their soporific action, thereby masking symptoms and assisting the disease to progress unrecognized. Strange diets are tried, and a varied assortment of patent foods is consumed. Spas are visited, baths, massage, and electrical treatment are indulged in; the abdomen is sometimes rubbed with bags of shot; enemata are resorted to; sometimes a course at Plombières. All is of no avail. The progress of the disease continues until the chances of cure by a radical operation are gone.

If abdominal pain with irregularity of the bowels, which is persistent for more than twelve months, were looked upon as sufficient to justify an exploratory operation many of these conditions would be disclosed before it is too late to eradicate them. It is very important to bear in mind that these carcinomata of the large intestine are not so likely to recur after operation as is carcinoma in other situations of the body. Provided that you can remove them during the first year or two the outlook is hopeful. I know a man working in this town now whose caecum I removed for carcinoma on February 7th, 1911, nearly ten years ago. He is well and strong and informs me that he can carry 2 cwt. At the time of his operation he was only 28 years of age. Professor Leith, who examined a section of the growth, reported it to be "a cubical-celled carcinoma with a few columnar cells." I hope particular notice will be taken of this man's age, because I know that cases are overlooked because they are "too young to have carcinoma."

Then there is the question of haemorrhage. Many of these malignant cases do not show this symptom, yet it is present in many innocent conditions. There may be occult blood in the faeces, and so there may be in innocent conditions. Ballooning of the rectum is another condition which may be present in either malignant or innocent affections. These are links in the chain of evidence, but they are not strong enough to carry conviction.

The treatment I advocate for these cases is to operate early and freely. If there is a chance to perform a radical operation for the complete removal of the growth, by all means do so. It may not be wise to do it all at one sitting. This must depend upon the case. Take, for instance, Case IV, noted below. He was sodden with toxins, and would not have stood any lengthy operation. The obvious need was to relieve his obstruction, to free him of the poisonous matter he was absorbing. The next day I was able to perform a short-circuiting operation. Had the patient been in a good condition I should have excised the growth in the first instance.

The excision should be a free one. At least 4 in. of healthy bowel on each side of the growth, together with the mesentery and lymphatic glands, should be removed. There is some difference of opinion as to the best method to be adopted after excising the growth. Some surgeons close the ends and then perform a lateral anastomosis. I prefer an end-to-end junction. It is true that the calibres of the cut portions of bowel may be different, but that difficulty can easily be surmounted by careful suturing. The end-to-end junction is the nearest approach to Nature's arrangement, and this, I consider, should always be our aim. I prefer simple suture to any mechanical appliances, and I use linen thread, which is always reliable in my hands.

Between September 28th and October 16th last I operated upon five cases of carcinoma of the large intestine, two of them on one afternoon. When I say the large intestine I do not include the rectum. The disease is not common, and it is therefore remarkable that these five cases should have presented themselves to me within eighteen days. The following are brief histories of each of these patients:

CASE I.

W. O., a male, aged 54, had suffered from pain in the right side of his abdomen for twelve months. The pain was more acute at times, but the patient could not associate this with anything which might account for it. He had lost flesh, and was anaemic. An examination of the abdomen revealed a tense globular swelling, about three inches in diameter, in the right hypochondriac region. It was dull on percussion, and appeared to be attached to the liver. I could not separate it from the liver. There was a right inguinal hernia, which was easily reducible. It was thought that the swelling might be a distended gall bladder, and an exploratory operation was advised. On September 28th, 1920, under chloroform and ether, a vertical incision was made through the right rectus. The appendix was found to be thickened and inflamed, and was removed. A mass of hard carcinomatous growth was found in the hepatic flexure of the colon. It was delivered with difficulty and excised, with about four inches of the ascending colon and four of the transverse colon on either side. An end-to-end junction was made by simple suture with linen thread. Enlarged glands were removed with the mesentery of the colon. The patient made an uninterrupted recovery, and was discharged on October 23rd. His bowels act regularly, and he has no pain.

CASE II.

E. T., a female, aged 45, had suffered from pain in the right hypochondriac region for more than a year. The pain was worse at times, and went through to her back. She thought she had gall stones. On examination of the abdomen there was tenderness and rigidity in the right iliac region. The patient would not allow a full examination. It was thought she might have chronic appendicitis. On September 28th, 1920, under chloroform and ether, I could feel a hard, irregular mass in the right iliac region, which I thought was a carcinoma of the caecum. A vertical incision was made through the right rectus. The carcinoma of the caecum was delivered and excised, together with the enlarged glands in the mesentery, 4 in. of ileum, and 4 in. of ascending colon. End-to-end junction was made with linen thread. I show you the specimen removed. You will notice that the growth is confined to the caecum; the appendix was not affected. The patient made an uninterrupted recovery, and was discharged on November 1st. Her bowels act regularly, and she has no pain.

* Read before the Kidderminster Medical Society on December 3rd, 1920.

CASE III.

G. B., a male, aged 55, had suffered from pain in his right iliac region for several months, probably more than a year. He had had difficulty in getting his bowels moved, and had lost weight. On examination of his abdomen a hard, irregular mass could be felt in the right iliac region. It was freely movable and was not tender. It was thought to be a carcinoma of the caecum. On October 5th, 1920, under chloroform and ether, the abdomen was opened by a vertical incision through the right rectus. The caecum, which was invaded by a carcinomatous growth, was removed with its mesentery, containing enlarged lymphatic glands. About 4 in. of the ileum and 4 in. of the ascending colon were removed. An end-to-end junction was made by simple suture with linen thread. I show the specimen removed, and you will notice that in this case also the growth was confined to the caecum, the appendix not being involved. The patient's after-progress was at first satisfactory. The sutures were removed from the abdomen on October 14th, when the wound was healed, with the exception of a sinus where the tube had been inserted. Three days later he began to fail, and he died of exhaustion on October 20th.

CASE IV.

R. P., a male, aged 68, had suffered from partial obstruction of the bowels for six weeks. The obstruction had been complete for a week. He had been vomiting for two days. The abdomen was tense and distended. Nothing could be felt. On October 11th, 1920, under chloroform and ether, a vertical incision was made through the left rectus muscle. On introducing the hand, a mass of new growth (carcinoma) was felt in the caecum. A Paul's tube was tied into the lower end of the ileum and about 50 oz. of foul-smelling intestinal contents drained off. The loop of intestine was fixed on the abdominal surface. The following day the patient was much improved, another 50 oz. of intestinal contents having drained away during the night. Chloroform and ether was again administered. About 12 in. of the small intestine was resected (including the aperture of the Paul's tube). The distal end was closed and returned to the abdomen; the proximal end was sewn into the transverse colon by simple suture with linen thread. I was unable to bring out the descending colon easily. The patient progressed satisfactorily for three days and then became weaker. His breathing was laboured, and he died on October 16th, at 11.45 p.m. There was no peritonitis and his abdomen was flaccid.

CASE V.

K. P., a female, aged 62, had had complete obstruction of the bowel for three days. The abdomen was distended. She had not vomited. On October 16th, 1920, under chloroform and ether, a vertical incision was made through the left rectus. On introducing the hand, a hard, annular stricture was found in the pelvic colon. It could not be brought outside the abdomen. A preliminary colotomy was performed on the descending colon and the bowel was opened immediately to give relief. On the 19th the patient was again placed under an anaesthetic and the colostomy was completed by division of the bowel. The result is satisfactory.

You will notice that four of these cases were of the columnar type and only one of the sclerosing form. In my experience the latter is more common. Three of the cases occurred in the caecum, one in the hepatic flexure, and one in the pelvic colon. In my experience the last named is more common, and it is usually of the sclerosing type. In some cases symptoms of sufficient importance are not noticed until obstruction occurs; even then the discomfort may not be great and it is often difficult to make the patient realize the danger he is in.

I have had the opportunity of observing several cases of this condition where operation had been refused or decided against. In each instance there was a perforation in about six weeks' time, accompanied by agonizing pain. One of the patients then begged me to perform an operation, which she had often refused previously. I washed out her peritoneum, stayed her agony, and enabled her to die in comfort. Another case I immediately relieved with an anaesthetic until the morphine had taken effect. All of these cases ruptured in the caecum.

In Case I there was a mass to be felt which appeared to be attached to his liver. His attendant, Dr. H. Miles, informed me after I had examined the case that he massaged this mass and it entirely disappeared. Perhaps if I had paid more attention to this information I might have suspected a collection in the bowel, which had been forced onwards. In Case II it was the tenderness and rigidity in her right iliac region which caused the patient to seek advice. It was a question between appendix trouble and gall stones. She was too rigid to allow of a proper examination, but when she was under the anaesthetic I had no difficulty in feeling a hard mass, which I diagnosed as a carcinoma of the caecum. In Case III there was a definite hard tumour to be felt in the iliac region. It was sufficiently well defined to allow of a correct diagnosis, but the man was too far gone for cure to be possible. In Case IV a complete obstruction for a week, with its attendant toxaemia, suggested that the obstruction was in the proximal end of the large intestine, while in Case V the picture pointed to a stricture in the distal portion.

The operation is a serious one and its mortality rate is high, but the alternative is either death or an artificial anus. Every case must be decided according to circumstances. I can imagine that the continuation of life for a brief period may be so imperative that a colotomy should be chosen in preference to an enterectomy. Even then the major operation might be performed at a later date. Some people, I know, would prefer death to either a colotomy or a colostomy, and there is much to be said for their view. If the growth is too extensive for removal it may be possible to perform a short-circuiting operation. This will give immediate relief without the horrors connected with an artificial anus.

I think that if the facts are put fairly before patients they will, in the vast majority of instances, accept the operation which will remove their disease, no matter what the risk. Of course, a surgeon is often placed in the position of making the decision himself. In the first two cases noted above I did not suspect the real condition, and it was not until after the patients were under the influence of the anaesthetic that I was aware of it. In neither case had I any hesitation in resecting the bowel, and both of them have made satisfactory recoveries. Perhaps they may be as fortunate as the man upon whom I operated in 1911. It depends largely upon the duration of their disease. If we are to obtain good results, we must get the cases sufficiently early.

I have already said that the onset of the disease is insidious, and that the symptoms may be slight, but I have also said:

"If abdominal pain with irregularity of the bowels, which is persistent for more than twelve months, were looked upon as sufficient to justify an exploratory operation many of these conditions would be disclosed before it is too late to eradicate them."

This is a question which is in the hands of the general practitioner rather than of the surgeon. It is he who has to watch the onset, and if he can realize the truth of my assertion he will be in a position to put before his patients the advantage which may result from an exploratory operation performed before they have drifted into a condition which is beyond the stage of cure, if not of alleviation.

GUNSHOT INJURY TO THE BRAIN INVOLVING BOTH CORTICAL AND SUBCORTICAL TISSUE.

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THE medical profession is greatly indebted to Henry Head for his contributions to the symptomatology of disease. In his very able and philosophic writings on sensation, the outcome of many years' painstaking investigations, he has furnished us with criteria by means of which we can locate a lesion implicating any part of the afferent system, whether this be in the peripheral nerves, the spinal cord, the brain stem, the optic thalamus, the internal capsule, its afferent fibres, or the cortex. Obviously the practical value of such criteria is very great, for they enable us to determine the situation of a lesion which, from a consideration of the motor and other symptoms of a case, we may not be able to do with certainty.

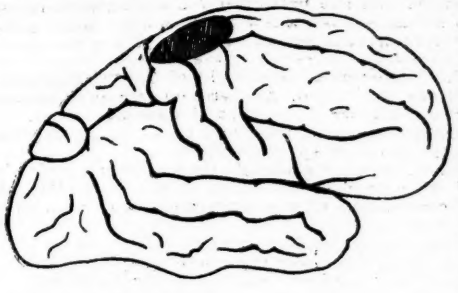
In some cases, however, when more than one part of the sensory system is affected, it may be difficult to decide from an examination of sensation which part is mainly involved. Thus, in the following case I have found it difficult to determine the extent to which the sensory disturbance is due to cortical or to subcortical destruction:

Private X., aged 32, was admitted to Brinnington Hospital on June 12th, 1920. At 9 a.m. on March 10th, 1915, he was shot in the head by a rifle bullet; he felt as if his head had been hit with a stick. He fell down, fancying "he saw little devils and that bells were ringing." He does not think he completely lost

consciousness, because he heard someone shout "stretcher-bearers." He was not, however, removed from the trench where he was shot till 7 p.m.; then he was fully conscious. He says that his right leg was crossed over the left, that both legs were useless, though he could move them very slightly. He could move his right arm a little, but was unable to move his left. The same night he was trephined; he does not know whether the bullet was found. His speech was impaired for about two months, and he had special difficulties with the letter "l." His right arm remained weak for about a month; his legs gradually regained some power, and by Christmas, 1916, he could feebly hobble about with the help of sticks. From March to June, 1916, he was in King's College Hospital, and later in King George's Hospital, where his head was *x*-rayed, but "nothing was found." He has been subject to attacks occurring every few weeks, which begin with a "filling-up sensation on the left side of the windpipe," then the left side of the mouth is puckered up and firmly closed; there is also slight twitching of the left side of the face; the mouth waters and he cannot speak for a few seconds; he does not feel confused. He says an attack lasts less than a minute; no attack has been seen since he came into the hospital.

Present State.

His present condition, six years after the injury, is as follows: His mental state, his speech, special senses, pupils, and the movements of his eyes are normal. The wound is represented by a lanceolate depression, 5 cm. in length and from 2 to 3 cm. to the right of the middle line; its anterior end is 16 cm. from the nasion, its posterior 19 cm. from the inion. The deepest part of the depression, which is near the anterior end, admits the tip of a finger, and the pulsation of the brain can be felt. In the accompanying diagram, kindly made for me by Professor Stopford, the probable position of the lesion is shown.



Motion.—The right arm and hand are normal. Some of the movements of the right foot are weak, and there is left hemiplegia. The weakness of the left side of the face is very slight. There is much rigidity of the left arm; the movements at the elbow and shoulder are strong, but weaker and stiffer than those of the right arm. The wrist is semiflexed, and his power to bend it more or to extend it is of the slightest. The hand is rigidly pronated, and he is unable to supinate it. The fingers, touching one another, are flexed at the two proximal joints and extended at the distal; the first joint of the thumb is slightly flexed, the second is extended, and the palmar surface of the end rests on the base of the terminal phalanx of the index finger. His attempts to move the digits are very feeble. The movements at the left hip and knee are good, but slightly weaker than those on the right side. Dorsiflexion of both feet is much impaired; that of the left foot is almost completely paralysed, that of the right foot is limited to a feeble inversion movement.

Reflexes.—Both knee-jerks are exaggerated, the left jerk more than the right. There is ankle clonus, most marked on the left side. Both plantar reflexes give an extensor response. The abdominal reflexes are feebler on the left than on the right side.

Sensation.—This is normal on the right side. On the left side gentle stroking with a wisp of cotton-wool is felt, but to a less degree than on the right side. The difference is scarcely appreciable on the face and trunk; sometimes he is uncertain, but his answers are usually in favour of the sensation being less plain on the left side. The difference, though still slight, is more distinct on the arms and legs, and is considerable when the fingers are tested. The ends of the fingers are most affected, and their palmar surface more than the dorsal, but his answers are inconstant; sometimes he feels gentle stroking, sometimes firmer stroking elicits no response. Tactile sensibility gradually improves in passing from the ends of the fingers to the wrist. Pressure touch over the fingers also seems to be diminished.

Localization, tested with a screen and observer's hand, is probably impaired, but the patient's indications are uncertain; sometimes they are correct, sometimes not—thus he may point to the fourth finger when either the second or the third is touched.

The appreciation of *roughness* appears to be normal, different grades being promptly recognized.

The *vibrations* of a tuning-fork are felt, but to a less degree than on the right side; they are felt two seconds longer on the joints of the right fingers, seven seconds over the styloid processes, and four or five seconds longer over the olecranon than over these prominences on the left side.

Compasses.—The threshold for recognizing two simultaneous contacts is probably raised on the left side: thus over the tips of the fingers it is 4 mm. on the right side and 5 mm. on the left; over the back of the forearm and the dorsum of the foot it is 2 to 3 cm. higher on the left side than the right. But the answers to this test are also uncertain; occasionally, indeed, a higher threshold is obtained on the right side.

Pain.—The prick of a pin is felt on the left side, but is less sharp than on the right side.

Pressure Pain.—The threshold, as measured with the algometer, is higher on the left side, the amount of pressure to evoke pain being ten on the left palm and seven on the right.

Thermal sensibility is not affected; he can distinguish cold from hot and also intermediate temperatures.

Position.—With eyes closed he cannot tell the position into which his arm is placed. In trying to touch the tip of one of his left fingers the normal finger goes usually to the ulnar side of the hand and sometimes to the base of the fingers and then gropes its way to the tip; occasionally it gets nearly to the tip at the first trial. The position of the fingers is often correctly imitated by the right fingers, but sometimes when the fingers, especially the second and third, are flexed, he thinks they are extended. He is apt to make mistakes as to the fingers moved; thus he may say it is the second finger when the third or the fourth has been moved. Slight passive movements of the fingers are not recognized, and large ranges of movement often elicit incorrect or uncertain answers.

The appreciation of *weight* is much impaired; with the right hand he recognizes that one ounce is heavier than half an ounce, with the left hand he does not appreciate any difference between one ounce and four ounces. The impairment is perhaps greater when the hand is supported than when unsupported. Curiously enough, he sometimes thinks the heavier weight is the lighter of two successive applications.

The appreciation of *size*, *shape*, and *form* is lost, and he is unable to name any common object, such as a knife, key, or coin, placed in the affected hand. He knows that something is in his hand, but cannot tell what it is. He does not feel any difference between a large watch and a florin, or between half a crown and a sixpence.

Texture is not appreciated; he does not feel any difference between silk, velvet, and flannel.

The main features of this case—namely, the hemiplegia and the hemianaesthesia—indicate a subcortical rather than a cortical lesion, whilst the paralysis of certain movements of the right foot shows that the lesion is not limited to the right cerebral hemisphere, but crosses the middle line to implicate the top of the left precontrol convolution or more probably the fibres proceeding from it.

The changes in sensation on the left side cannot, however, be wholly explained by a subcortical lesion. The uncertainty in the patient's responses to tactile impressions, to localization, and sometimes to the compass test suggests interference with the sensory activity of the cortex, which is still further indicated by the inability to recognize objects placed in his hand, combined with a loss of appreciation of weight. The loss of recognition of the posture of the affected arm—a striking feature of the case—may occur in subcortical as well as in cortical lesions, but in the former condition, Henry Head says, "the patient remains conscious of the existence of his limbs, though he does not know where they lie, whilst with lesions of the cortex he may lose all consciousness of the existence of the affected parts." I have found it difficult to make my patient appreciate the distinction. He says that on waking from sleep he does not know where his left arm is, but cannot say whether or not he is conscious of the existence of the limb.

THE SURGICAL TREATMENT OF CHRONIC SCIATICA.*

BY

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WHILE the majority of cases of sciatica can be cured by medical means there are still a certain number in which medical treatment fails. In these cases the patients are usually almost completely incapacitated by their pain and, if it is not relieved, they tend to drift into a condition of chronic invalidism. I am satisfied that, in a considerable proportion of these cases, a rapid and complete recovery can be obtained by operation. The benefits of surgical treatment have not been as widely recognized as they might, on account, I think, of two reasons: (1) a lack of appreciation of the type of case suitable for operation, and (2) the performance of an unsatisfactory operation—namely, nerve stretching. If the correct type of case is

* Read at a meeting of the Royal Medico-Chirurgical Society of Glasgow, March 18th, 1921.

selected and the operation of nerve-freeing performed, a cure can be obtained in practically every instance.

The term "sciatica" is often used to cover pain in the sciatic nerve arising from very different causes, so that, in the first instance, it is necessary to be particular regarding the diagnosis. A considerable number of diseases may cause referred pain in the sciatic nerve, such as hip-joint affections, tumours or inflammatory conditions in the pelvis, exostosis, and nervous conditions both organic and functional. It is therefore essential to exclude all such causes of sciatic pain by a careful examination before one assumes one is dealing with a lesion of the nerve itself. The term "sciatica" should be confined to pain arising from inflammation or the effects of inflammation of the sciatic nerve.

It is only in chronic cases that have failed to recover under medical treatment that there is any question of surgical interference. Further, not all of those chronic cases are suitable for operation, so that it is necessary to differentiate them carefully by the symptoms to which they give rise. I have roughly classified them into three groups:

1. Cases in which the patient is quite free from pain while at rest but begins to have pain on exercise or on assuming some special position.
2. Cases in which there is a certain amount of pain while at rest, but where it becomes really intense on exercise or on the assumption of a particular position.
3. Cases in which the pain is of an indefinite character, present at rest off and on, and sometimes improving to a certain extent on exercise.

In the first type the pathology of the condition seems quite clear. The inflammation of the nerve has subsided, but adhesions have been left round the nerve as a result of the inflammation. These vary from fine adhesions to definite bands of fibrous tissue. Their mode of action seems clear, as it is only on movement that they drag on the nerve and set up pain. This type is pre-eminently the one suited for surgical treatment, and in cases of this nature one can be certain of a rapid and perfect recovery by operation.

In the second type one has the same condition of adhesions round the nerve, but, in addition, one presumes there is a varying amount of inflammation of the nerve itself still present. In some instances it is possible this may be kept up by the pull of the adhesions, especially where the patient has been making great efforts to go about. The majority of cases of this nature can also be cured by operation. In this class of case the pain sometimes takes longer to disappear completely.

In the third type the pathology is not so clear, but it would seem likely that here one has a neuritis without the presence of adhesions round the nerve. In the only case of this kind where I have operated no adhesions were found. This type appears to be unsuitable for surgical treatment.

Treatment.

The surgical treatment of sciatica was first placed on a satisfactory basis by Crawford Renton,[1] who in 1897 published an account of his operation and of the cases where it was indicated. The operation is extremely simple, and consists essentially in the freeing of the sciatic nerve from adhesions. This is done by exposing the nerve below the gluteus maximus by a four to five inch longitudinal incision, hooking it up, and then carefully removing all adhesions from the sacro-sciatic notch to about the middle of the thigh. The adhesions may be fine and readily separated by the finger, or they may consist of strong bands that have to be divided. All tags and loose ends of adhesions should be dissected away. The branches to the hamstrings which come off just below the lower border of the gluteus maximus should be preserved. The nerve is then dropped back into the wound and the skin sutured. No splint is applied, but the patient is kept in bed for ten days and then allowed up.

In performing this operation one does to a certain extent pull on the nerve, but the essential feature is the removal of the adhesions. It is quite easy to demonstrate that no reasonable amount of nerve stretching will separate all the adhesions. Further, cases have been cured by this operation which had previously had nerve stretching performed without benefit. As a general rule patients are free from pain as soon as they get up, but sometimes a few weeks elapse before the pain completely disappears. The results of this simple operation have been most satisfactory, and patients who had been more or less confined to bed for periods of six months to two years have been able to take up active occupations in a short time.

It is not possible to give records of a very large series of cases, as the operation is only indicated in a limited number of patients. Crawford Renton[2] has recorded thirty-two cases of operation extending over a period of thirteen years, and all of these were cured or rendered well enough to return to active life. I personally have operated on ten cases; six of these were of Type I, and all of them recovered completely; three were of Type II, and of these two made a complete recovery, but the third, although greatly improved and able to return to active work, still complained of some pain and numbness of his foot a year later. One case was of Type III; no adhesions were found, and no benefit followed the operation.

Illustrative Cases.

Type I.—I. R., a woman aged 33, a patient of Dr. MacLennan, Govan. She had been almost entirely confined to bed for nine months with a left-sided sciatica. Under medical treatment the acute pain had passed off and she was now quite comfortable when lying in bed. On attempting to walk the pain came on severely, and she particularly complained of being unable to sit for more than a few minutes without the pain becoming so severe that she had to lie down. There was practically no tenderness on pressure over the nerve, but stretching it was painful. There was some atrophy of the thigh and the Achilles reflex was diminished. At operation definite adhesions were found round the sciatic nerve, and these were freed. A fortnight afterwards she could walk and sit without pain, and five months later she remained perfectly well.

Type II.—W. M., a sailor aged 29. He had been completely incapacitated with pain in his right sciatic nerve for six months. He complained of a certain amount of pain even when resting, but especially of inability to walk any distance without the pain becoming so severe that he had to stop. There was some tenderness over the nerve, and it was painful on stretching. There was some atrophy of the thigh and the Achilles jerk could not be elicited. His sciatic nerve was freed from adhesions and a few weeks later he was quite comfortable and able to walk without pain. When seen nine months later he was still perfectly well.

R. D., a man aged 53, a patient of Dr. Gibson Graham, had had pain in his left sciatic nerve for eighteen months. In spite of medical and electrical treatment it did not improve. He complained of pain and numbness in his leg and foot even when at rest. Exercise greatly increased the pain, and he could only walk a short distance. There was tenderness over the nerve and pain on stretching it. There was atrophy of his thigh and leg muscles, and the Achilles reflex was gone. The sciatic nerve was exposed, and a considerable number of adhesions separated. A month after operation he could walk much better, although he still complained of some pain. He improved steadily, and was able to return to active work three months later. At the present time—a year after operation—he is doing active work, but states that he still has some pain and numbness of his foot at times. His Achilles jerk is still absent.

Type III.—J. S., a man aged 50. He gave a history of sciatic pain on the left side of two years' duration, which had persisted in spite of medical treatment. He complained of irregular attacks of pain often coming on while at rest. The pain was sometimes severe in the morning, and improved when he had been going about for a little. There was tenderness over the nerve and pain on stretching it, as well as considerable atrophy of the thigh and gluteal muscles. The Achilles reflex was absent. At operation practically no adhesions were found, and no improvement followed.

Conclusions.

1. Cases of sciatica which are free from pain while at rest but in which the pain commences on exercise can be cured by operation.
2. Cases in which there is a certain amount of pain while at rest but where it becomes much more severe on exercise can usually be cured, or at any rate greatly improved, by operation.
3. The operation consists in the freeing of the sciatic nerve from adhesions and not merely in nerve stretching.

REFERENCES.

[1] Crawford Renton: The Surgical Treatment of Sciatica, *Scottish Med. and Surg. Journ.*, 1897. [2] Crawford Renton: Sciatica and its Surgical Treatment, *Proceedings of the Royal Society of Medicine*, Surg. Section, May, 1908.

IN a paper read at a meeting of the Society of Public Analysts, on April 6th, Dr. J. C. Thresh stated that the conflicting views held with reference to the action of water on lead had induced him to reinvestigate the matter. He found that if water were free from dissolved oxygen it had no action on lead, but that if free oxygen were present action began instantly and continued until all the oxygen was used up.

SURVIVAL AFTER OPERATION FOR ANNULAR MALIGNANT DISEASE OF THE LARGE BOWEL.

BY

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THE cases here recorded encourage a resort to surgical treatment:

CASE I.—*Lived Seven and a Half Years with a Fistula.*

A man, aged 78, of powerful physique, seen with Dr. Andrew Elliot and Dr. R. P. Cockburn, had suffered for many months from an increasing intestinal obstruction located in the transverse colon. Operative treatment was recommended, but no guarantee could be given that the formation of a fistula would be avoidable, and nothing was done until a bout of vomiting with increasing abdominal distension seemed likely to terminate in death. During this attack, on June 15th, 1913, I opened the abdomen in the middle line above the umbilicus, and felt an annular constriction of the transverse colon near the splenic flexure. A lateral fistula was made in the presenting portion of the enormously dilated large bowel, which was afterwards identified as ascending colon. Further treatment was considered unwise at that time.

The patient bore the operation well, and recovered satisfactorily with hardly any vascular or other disturbance. From the first he was subject to attacks due to accumulations in the transverse colon which were accompanied by pain, discomfort and high temperature, until an offensive discharge took place through the fistula. Dr. Cockburn kindly informs me that after about four years these attacks began to be associated with escapes of irritating matter, mainly mucus, through the anus, by which small quantities of faeces were passed at intervals to the last. Between the attacks the patient was wonderfully well and able to go out until the end of October, 1920, about which time secondary nodules were discovered, first in the hepatic flexure, and later throughout the abdomen. The patient died on January 6th, 1921, more than seven and a half years after the operation.

It was proposed to short-circuit this patient's ileum into his sigmoid flexure and, if possible, to remove the strictured bowel when he recovered from the fistula formation. Elderly people of strong physique, especially those with powerful hearts, bear operations well, and this patient appeared to be capable of undergoing successfully the necessary interference, but he refused further surgical treatment. His record shows that an annular malignant stricture of the colon may long remain local, and clearly the full advantages which surgery may give were not obtained in this case. After a successful second operation the man might have been quite well now, but such results cannot be secured without risk.

CASE II.—*Apparently well 23 Months after Hysterectomy and Proctectomy.*

A woman, aged 44, married five years but never pregnant, was sent to the Samaritan Free Hospital under my care by Dr. Reginald Clark. An abdominal tumour apparently existed before her marriage and greatly increased in size in the last few months, during which the patient rapidly lost weight until emaciation, anaemia, and feebleness were extreme. There was no intra-abdominal pain or tenderness, but vaginismus prevented a satisfactory examination. On March 28th, 1919, under anaesthesia, an oval tumour was defined rising to the ribs from low in the pelvis, and so fixed by its size that its origin could not be ascertained. A uterine sound was not used. In the rectum, three inches from the anus, an ulcerating growth completely encircled the bowel, but caused no constriction and little discharge. A piece of this, removed for examination, showed the structure of a carcinoma. The rectum moved freely behind the large tumour, which was thought to be ovarian and probably malignant.

The proper treatment was to operate if the rectal condition had not existed, and the rectal growth, apart from the other, appeared to be removable. The propriety of interference with these doubtful conditions had to be the more seriously considered because of the feeble condition of the patient. She, however, expressed a very strong desire to take any risk on the chance of getting relief from her discomfort and sense of weakness. It was therefore decided to explore the abdomen, the patient being told that if the large tumour could be removed it would be wise to treat the rectum by a second operation later.

First Operation.—On April 1st, 1919, an incision exposed a large fibromyomatous uterus, with its base deeply buried in very oedematous broad ligaments. The oedema seemed to be due to pressure. The whole uterus and the left ovary and tube were removed. Before closing the abdomen the rectal growth was examined and no sign of its extension beyond the bowel was found. The liver also seemed normal. The patient, although somewhat collapsed for a few days, recovered well. The highest temperature was 100.4° F., the highest pulse 110. The tumour contained many cysts full of degenerating fluid, but no malignant growth was found in it.

Second Operation.—Five weeks later, on May 6th, 1919, the patient's condition being much improved, the abdomen was again opened. After freely separating the rectum from its connexions, an attempt was made to bring the upper end of the divided sigmoid flexure down to be joined to the bowel close to the anus. This was impossible without either undue tension or division of a large vessel which nourished the greater part of the sigmoid. The attempt to make an end-to-end anastomosis had therefore to be abandoned, and the divided upper end of the sigmoid flexure was brought out on the groin as a fistula. After removal of the rectum and the anal mucous membrane down to the external sphincter, the pelvic floor was closed with difficulty, because of the absence of the uterus. The right ovary and tube helped to fill the gap, but a very large cavity remained and was packed with gauze round a drainage tube introduced through the anal wound. The abdominal incision was then closed.

After-History.—The patient was much more feeble after this operation than after the first, and a great deal of discharge escaped from the anal opening, but it gradually ceased. The temperature rose to 103° F. on the third day, the pulse to 120. Both then fell until the fourteenth day, after which they were normal and the patient went home, almost healed, fifty-one days after the second operation. A month later (July, 1919) she weighed 6 st. 7 lb. On December 21st, 1920, she weighed 11 st. 13 lb., and had every appearance of robust health. The pelvic parts were all soft and the fistula acted well.

Dr. W. H. Baker tells me that her condition is still quite satisfactory. Of course, within two years of an operation for cancer a patient's future must be considered uncertain, but the first of these histories shows that a bowel cancer may be localized for a long time. In the second it seemed certain that a wide removal of the disease had been effected, and in any case the result to the patient has already amply justified the operative interference.

THE HOSPITAL TREATMENT OF FRACTURES:

A SUGGESTION FOR CENTRALIZATION.

BY

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IN 1908, in an address before the Medical Society of London, on the "After-effects of injuries," the late Mr. Clinton Dent made some statements as to the results of fractures amongst members of the Metropolitan Police Force. These men, who, before their injuries, were physically almost perfect, were treated in various metropolitan hospitals, and Mr. Dent, as consulting surgeon to the police, had to pass judgement on the final result and estimate the functional recovery. He stated that the results were much less favourable than was generally imagined, and he made a strong plea for the better care of fractures. He particularly pleaded that early fixation in plaster-of-Paris for a period judged to be long enough to ensure sound union should not be adopted as a routine line of treatment. He found that, after fractures of the lower limb, 30 per cent. failed permanently to get full functional recovery, and very few had fully recovered in six months from the time of the injury. It is probable that this figure represents fairly accurately the state of affairs to-day.

In 1908, and since that time, the fractures admitted to most of our general hospitals went to the wards which happened to be receiving urgent cases, quite regardless of whether the surgeon in charge of those wards had any special interest in the treatment of fractures or not. In most busy general surgical units a serious fracture is not looked upon as a welcome visitor. It is a case which is certain to hold up a bed for a long period, and which will interfere with the admission of more interesting general surgical cases. In the present state of busy wards and long waiting lists, it becomes almost the first business, therefore, to get the fractures disposed of as quickly as possible. Two chief methods offer themselves: First, transfer to a Poor Law hospital with its multitudinous beds, or, secondly, discharge to the patient's home after fixation on some form of splint which cannot be interfered with, such as plaster-of-Paris.

When one remembers that an inferior result after a fracture of the lower extremity may permanently reduce

the capacity of a young and strong workman from full hard work to light work, or "no ladder work," or some seriously limited occupation, it is obvious that the very best effort should be put forward to procure the most perfect functional result which is possible. In order to ensure this result it is very desirable that the same surgeon should supervise the case from start to finish. He should be entirely responsible for the case whilst in the wards; he should supervise its manipulation and splinting, its early massage, and, on discharge, its progress through the out-patient department and physio-therapeutic department. He should control the entire physio-therapeutic treatment.

Many of our general hospitals now have orthopaedic departments. In these hospitals the fractures naturally go to the wards associated with this department. The work of an orthopaedic surgeon differs in one very important respect from that of the general surgeon in that the former frequently has to undertake much more prolonged after-treatment of his patients. The operative measures employed, though essential and highly important, may be a mere incident in the course of the whole treatment. Weeks or months of patient physio-therapeutic measures, accompanied by the constant supervision and adjustment of mechanical appliances, may be required in order that the value of the operation may not be lost. Similarly in the case of fractures, supervision of the whole of the after-treatment is of the very highest importance. In hospitals which have no special department for orthopaedics, a member of the surgical staff should be selected to take charge of the fractures. He should naturally be one with some leaning towards orthopaedics, who would be able to devote the necessary time to the work, which would, in this case, be in addition to his general surgical duties. He should be allotted a sufficient number of additional beds for fractures. This number will be arrived at from a survey of the in-patient records. It will be found to work out, in the average general hospital, at 6 per cent. of the total surgical beds. In areas which are almost entirely industrial this figure may be a little higher.

Under a system of centralization such as this the surgeon in charge becomes more expert in his methods, the house-surgeon of the unit receives real thorough instruction and practice in his art, the nursing staff becomes extremely skilled in the handling and adjustment of splints and the nursing of patients in fracture apparatus, and the general wards are relieved of cases which are somewhat alien to them. At Salford Royal Hospital, where an orthopaedic department was opened in 1918, the system has worked extremely well and with the greatest advantage to all concerned.

NOTES ON A GIANT.

BY

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SINCE Ord described "the cretinoid state in adult women," and surgeons showed that complete removal of the thyroid gland brought about myxoedema, the functions of the ductless glands have been constantly investigated. Before that time we knew only that the complete removal of the sexual glands in man, sheep, cattle, horses, and other animals not only prevented reproduction, but made them docile and fat, thus affecting character as well as growth. Afterwards Marie, in 1885, showed that growths and hypertrophy of the pituitary gland caused acromegaly, and since then it has been slowly established by surgeons that the anterior lobe of the pituitary gland presides over the growth of the body. This discovery led Professor D. J. Cunningham to slip his finger through the foramen magnum of the skull of Hunter's costly giant, Byrne, in the Hunterian Museum, and to discover its expanded and shallow pituitary fossa; and Professor Arthur Keith later to cut a window in the cranial vault, and so render the enlarged fossa visible to the eye. (John Hunter is said to have paid the watchers of Byrne's corpse £500 to allow the body to be kidnapped.)

Recently E. Uhlenroth, of the Rockefeller Institute, has produced experimental giantism—that is, growth beyond the normal size of the species—in salamanders by feeding them on the anterior lobe of the pituitary gland. The function of the posterior lobe is unknown, and when given as food not only was growth not stimulated, but actually retarded. It is the intermediate part of the gland that supplies the extracts which excite unstriated muscle, raise blood pressure, and produce diuresis.

The effect produced depends on the developmental stage of the salamander; no effect is produced on the larvae. At the stage when growth ceases or is normally much lessened, cell proliferation can be enforced by the specific substance in the anterior lobe of the hypophysis.*

The giant "F." consulted me six or seven years ago. He was then 20 years of age, his height was 7 ft. 8 in., he was still growing, and he weighed over 22 st. Although so tall he was fairly proportionate, except that his hands, feet, skull, and lower jaw were perhaps unduly large. His hands were long and shapely, and differed from the short, broad, spade-like hands and sausage-like fingers of the acromegalic, the age of onset accounting for the difference. When the disease is congenital or begins during the growing period of youth, giantism results; if after 25, acromegaly is produced. When "F." stretched out his arm at right angles to his body, the writer (height 5 ft. 11 in.) could walk comfortably under it. "F." knew that giants died young, and his ambition was to live long enough to outgrow the Chinese giant, who, he said, was 8 ft. 4 in. in height. So far he had had no serious illness. His sexual organs were normal. He had no pressure symptoms in his brain, and these were not to be expected, as an *x*-ray photograph showed a pituitary fossa quite normal in shape. All his bones were overgrown in breadth as well as in length, and the soft structures of the body were similarly affected; nor is this surprising as far as the muscles are concerned, when it is remembered that biologically bone is secondary to muscle and not muscle to bone. Three excellent skiagrams were taken for me by Dr. A. C. Norman, and I append a description of each:

Giant "F." with a man of ordinary height standing beside him.

1. *Skull.*—The sella turcica—like a capital U in shape—admits two-thirds of a shilling in the antero-posterior plane, whilst that of an ordinary skull will admit only a threepenny piece. The greatest length from chin to occiput is 12½ in. From forehead to occiput measures 9¾ in. The thickness of the skull in many places measures ¼ in., and at the external occipital protuberance ¾ in. The air-containing sinuses are very large, especially the frontal, which measures 2 in. antero-posteriorly. The lower jaw is huge.

2. *Forearm and Wrist.*—The inferior extremities of the radius and ulna are not yet joined to their respective shafts as they should be at the age of 20. His limbs are, therefore, still growing.

3. *Hand and Wrist.*—From the wrist-joint to the tip of the middle finger measures 11½ in. The greatest breadth of the hand at rest at the head of the first metacarpal bone measures 6 in. The parts of the hand are proportionate. His thumbnail is 1½ in., and that of his middle finger 1 in. in length. Ossification: (*a*) The heads of the inner four metacarpals are joined to their respective shafts, and so is the base of the thumb metacarpal to its shaft, as they all should be at the age of 20. (*b*) The bases of the first and second rows of the phalanges are not yet united to their shafts as they should be at 20; but those of

* *Lancet*, February 12th, 1921, p. 358.

the third row are as they should be at his age. The fingers and the thumb are evidently still growing.

"F." had an average intelligence and was not ungainly, though most giants are said to have been dull, feeble, ungainly, and short-lived. Magrath, 7 ft. 5 in., died in 1760 at the age of 24. Chang, the Chinese giant, was an exception, and so was the Russian, Machnow, who at 23 measured 9 ft. 3 in., and was well proportioned. He was, perhaps, the biggest of modern giants. Byrne measured 8 ft. 4 in. after his death, which took place at 22. Og, the king of Basan, was handsome (Josephus), and his iron bedstead was 13 ft. 6 in. by 6 ft. Goliath of Gath was 9 ft. 6 in., or according to Josephus 8 ft. 9 in., and his hand was big, for "the staff of his spear was like a weaver's beam." Classical evidence of giants measuring 46 and even 60 cubits is mythical and untrustworthy. The Scriptural evidence of races of giants does not amount to much. The two Hebrew words translated "giants" in the Authorized Version and "nephelim" and "mighty men" in the Revised Version did not apparently apply to giants in our sense of the word.

Even the celebrated naturalists Cuvier and Buffon fell into the popular delusion of there being "giants in those days" by figuring the fossil bones of elephants, rhinoceroses, mastodons, etc., as remains of human giants. Nevertheless human skeletons of extraordinary size have been found in the caves in the "Red Rocks" of Mentone, where they measured 6 ft. 6 in. in length, and showed evidences of powerful muscular development; and in Scotland, where five such skeletons were found together at Logie Pert, Forfarshire. We must therefore admit that giantism may be racial as well as the result of disease. The tallest men now living in the British Isles are said to be the villagers of Balmaclellan, in Galloway, whose average height is 5 ft. 10.46 in. (Dr. Beddoe). The average height of the Tehuelches of Patagonia is only 5 ft. 10 in.

INVOLVEMENT OF THE ORBIT IN DISEASE OF THE NASAL ACCESSORY SINUSES.

BY

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It is not so very long ago that most cases of orbital cellulitis applying for relief at large ophthalmic clinics were regarded as of unknown origin. Even now the most diligent inquiry often fails to explain the mode of onset in certain cases. It should, however, always be remembered that until the ophthalmic surgeon can prove the accessory sinuses of the nose healthy, he is not justified in looking for a more obscure seat of origin elsewhere. The intimate relation between the orbit and the nasal accessory sinuses is familiar to all. To those who dip slightly deeper, and familiarize themselves with illustrations of the work of Onodi or of others who have for a considerable time drawn attention to this important matter, it must appear strange that extension from infected sinuses to the cellular tissues of the orbit is not more frequent. Probably mild degrees of periostitis are much more frequent and much more serious than is commonly thought. If ophthalmologists have been to blame in the past for accepting orbital cellulitis as a clinical entity, this cannot be said of those rhinologists who of recent years have devoted so much time and labour to the nasal accessory sinuses. Owing chiefly to their researches, it is now a recognized fact that cellulitis of the orbit is nearly always due to accessory sinus disease.

In a large out-patient department like that of the Government Ophthalmic Hospital, Madras, a considerable number of such cases report for treatment. More than half of the cases are children, in whom it is often very difficult to locate the sinus trouble; fortunately in adults it is simpler. In either case the nose should be carefully examined by the usual inspection methods; transillumination should be performed, and, if possible, a good *x*-ray photograph obtained. In children the sinus disease is more often of a primary acute nature, whilst in adults it is more frequent to meet with an exacerbation of a chronic condition. It is remarkable how often orbital cellulitis clears up by mere drainage, but it is to be remembered that a certain number of patients come back later with optic atrophy. This note is intended, however, to record the comparative frequency with which one of these sinuses was responsible for cases of orbital trouble reporting to this hospital during the last quarter of 1920. Six cases in all were met with. This is greatly in excess of the average rate at which orbital complications are met with in frontal sinus disease in Madras. The case notes are as follows:

CASE I.

R. P., Hindu male, aged 27, presented himself on September 19th, 1920, complaining of swelling of the left upper lid of three months' duration. His sight was not affected, but he had been troubled with nasal discharge. There was a small, rounded, firm swelling below the middle of the superior orbital rim and marked ptosis. While examining the cyst-like tumour the patient volunteered the information that he could empty it, and proceeded to do so by squeezing firmly upon it and evacuating the contents (about a drachm of muco-pus) upon the floor. There was tenderness on pressure against the floor of the sinus. The left nasal fossa showed hyperaemia, swelling of the middle turbinate, with polypi and pus in the middle meatus. A frontal sinus probe could not be passed; transillumination was negative. An *x*-ray photograph showed small symmetrical frontal air sinuses without marked septa. A certain amount of fogginess on the left was the only indication of disease. There was no history of syphilis, and the Wassermann reaction was negative. Both fundi were normal.

Drainage by the intranasal route was adopted. The anterior part of the middle turbinate was removed with scissors and snare, and the ethmoidal cells broken down. A large escape of pus occurred on opening the agger cells. As the ostium of the frontal sinus was cleared and enlarged, pus flowed freely into the middle meatus. Drainage was established by enlarging the fronto-nasal canal and ostium. Irrigation was subsequently carried out for a short time. The patient left hospital on October 28th, 1920, free from swelling, ptosis or tenderness, and without discharge from the frontal sinus.

CASE II.

R., Hindu male, aged 30, came to hospital on September 20th, 1920, complaining of dull vision on the right side and discharge from the upper lid. R. eye, V. = F. at 2½ metres due to old leucoma; fundus normal. L. eye normal. The lid disease commenced three and a half years ago with unilateral headache and offensive nasal discharge. He had interrupted attacks of pain during this time. During one of these, five months ago, a swelling appeared below the brow. He had it opened, and as it would not heal he came to hospital. The sinus led to necrotic bone in the roof of the orbit. Examination of the nose showed polypi, and pus in the middle meatus. A frontal sinus cannula could be passed on the left but not on the right. Transillumination was negative. An *x*-ray photograph showed very extensive frontal sinuses on either side, divided into loculi by well-marked septa. There were large orbito-ethmoidal cells. The Wassermann reaction was negative, and there was no clinical evidence of syphilis.

The external route was chosen for operation. A Killian incision was made and the frontal sinus opened at its inner end. The mesial septum between the sinuses was eroded, and a probe could be freely passed through to the temporal region on the left. The left ostium communicated freely with the nose, that on the right was effectively blocked. There was erosion of the floor of the right sinus and subperiosteal pus over the os planum and lacrymal bone. The orbito-ethmoidal cell was opened and both it and the frontal sinus were put in free communication with the middle meatus. The necrotic inner wall of the orbit was removed. The wound was partially closed, drainage being established from its inner end through the free opening into the nasal fossa. For some time gauze wicks were renewed daily, then irrigation with a frontal sinus cannula was carried out. Clear fluid returned from both sinuses after about five weeks, and he was discharged almost well on November 11th, 1920. In this case the Killian type of operation was adopted, and the trochlea was saved by leaving a bridge. The lacrymal sac had to be removed. The important points in such cases are to establish good intranasal drainage without doing muscular damage, and avoid deformity due to subsequent contraction of scar tissue.

CASE III.

K. M., Hindu male, aged 40, reported on October 16th, 1920, complaining of swelling and pain of the left eye. R. eye, V. = 6/18, fundi normal. He gave an unreliable history of the swelling starting one and a half months before. He had no nasal discharge. He denied syphilis, but his wife had a suspicious record. The Wassermann reaction was positive. His right eye was much proptosed, there was extensive swelling of the lid, brow, and root of the nose. There was a pulsating swelling about the size of half an eyeball an inch above the inner end of the right brow. On firm pressure this disappeared and a circular loss of bone could be felt. This gave the patient acute pain, and caused the swelling of the lid to increase. The nasal fossa was so swollen and oedematous that nothing could be made out, even after thorough packing with cocaine and adrenaline. There was obvious bony deformity, and exposed

bone could be felt high up with a soft blunt probe. An *x*-ray photograph showed large frontal sinuses divided into loculi with a fairly sharp outline on either side. There was a definite general haze round the glabella, but no indication of an opening in the anterior wall of the left sinus. The antra were clear on transillumination.

On October 18th, 1920, the pulsating swelling was opened by a vertical incision and a large quantity of glairy muco-pus escaped. Through this opening the sinuses were explored and were found to reach 2 in. above the orbital rim, and to the external angular processes. The nasal fossa was easily entered with a blunt probe on the right but not on the left. A Killian incision was made. This disclosed a complete absence of the roof of the orbit and extensive caries with the dura exposed above. The nasal fossa was now easily entered on the left. The carious ethmoidal cells were curetted away and a large drainage orifice made into the nose. Gauze wicks were led through from the upper incision and the inner extremity of the lower incision to the nose, and from the body of the sinus to the outer angle of the wound. In spite of careful drainage and vigorous antisyphilitic treatment it became obvious after some time that it was essential to remove the anterior wall of the left sinus and let the skin fall in. This was done on January 7th, 1921, good drainage was established right and left, and after careful curetting the wound was lightly packed. The patient made an uninterrupted recovery. The deformity was, of course, considerable.

CASE IV.

A. C., Anglo-Indian, aged 51, was admitted on October 22nd, 1920, with proptosis of the right eye, with swelling and oedema of the lid and brow, and acute pain. There was no impairment of vision. The first symptoms he noticed were bulging of the eye and double vision. A month previous to this he got a knock on the brow, and a week before exposed himself by sitting up shooting. Shortly after this severe pain started. When seen at hospital he presented a typical picture of orbital cellulitis. An incision was made in the superior fornix and pus evacuated, but this did not relieve the condition, and a fluctuating swelling appeared over the outer third of the eyebrow. Nasal examination revealed oedema of the middle turbinate and pus coming from the frontal sinus. No *x*-ray photograph was obtained. On November 13th, 1920, the frontal sinus was opened by the intranasal route. This did not relieve the condition, and a week later the external operation was done. There was caries of the orbital rim and a large pocket of pus under the periosteum of the orbital roof, which was perforated and opened into the frontal sinus. The latter was small and communicated with the superior meatus with a very angular fronto-nasal duct. Free drainage was established into the middle meatus, and gauze drains led through. About a month later a large sequestrum was removed from the outer part of the orbital rim. The patient frequently complained of severe neuralgic pain. In spite of a negative history of syphilis and a negative Wassermann reaction he was put on mercury and iodides. He improved steadily, but still complained of supraorbital pain. He was discharged at his own request, without diplopia, and with diminished proptosis, but there was considerable interference with the movement of the upper lid due to adhesions to the periosteum at the orbital rim.

CASE V.

This was a case of very extensive ulceration of the orbit and frontal sinuses, due to gummatous disease, superimposed upon which was myiasis. This case has already been fully recorded, as it was of interest also from an entomological point of view, the adult flies having been hatched out from the maggots.[1]

CASE VI.

M. R., European, aged 42, was admitted on December 31st, 1920, complaining of acute supraorbital pain on the left side, which had prevented him from sleeping for some time. He had very slight swelling of the lid and thickening of the supraorbital nerve. There was pain on pressure against the orbital rim and the nerve was excessively tender. The vision was 6/5 for both eyes and the fundi were normal. There was a negative history of syphilis, no clinical signs, but a positive Wassermann reaction. An *x*-ray photograph was not obtained. Transillumination was negative. He gave a history of a very severe fall from a motor bicycle five months before, with temporary unconsciousness and bleeding from the ear. The exact location of the latter was somewhat uncertain, and he had a perfectly normal drum. There was no history of influenza or acute catarrh. The nasal fossa looked healthy, but on passing a cannula into the fronto-nasal duct a small quantity of muco-pus was evacuated. He was given an injection of novocain, followed by alcohol, into the supraorbital nerve, which relieved his pain. On December 31st, 1920, the anterior end of the middle turbinate was removed with scissors and snare and the ostium of the frontal sinus enlarged. The anterior ethmoidal cells were also broken down. He developed a third nerve paralysis three days after operation. He was put on injections of mercuric cream and novarsenobillon on alternate weeks and rapidly got better. On January 21st, 1921, the paralysis had almost gone and there was no diplopia. He had no pain and his nasal fossa and sinus were apparently healthy.

REFERENCE.

[1] *Indian Medical Gazette*, February, 1921, p. 58.

THE ISOLATION OF DIPHTHERIA BACILLI.

BY

DENYS R. WOOD, F.I.C.,

PUBLIC ANALYST AND BACTERIOLOGIST, SOMERSET COUNTY COUNCIL.

IT is sometimes necessary to obtain the diphtheria bacillus in pure culture in order to test its pathogenicity, as, for instance, when found in swabs taken from lesions other than the throat and nose, such as the ear, the eye, and sores on other parts of the body, and occasionally from the throat and nose also in the case of very persistent carriers.

A useful medium for this purpose is described in Browning's *Applied Bacteriology* as follows:

Sheep serum, sterilized by heating on several occasions for one hour at 57° C.	5 c.cm.
1 per cent. telluric acid in distilled water ...	0.9 c.cm.
Peptone water agar (roughly neutral to litmus) to	100 c.cm.

The serum and telluric acid solution are added to the melted agar at 50° to 55° C. before pouring into Petri dishes.

In my experience sheep serum, when the blood is obtained from the abattoir, is seldom sterile when heated at 57° C. for one hour on seven or eight consecutive days, and the ether and chloroform methods of sterilization are equally unreliable, in fact, the only reliable method appears to be filtration through a Chamberland filter. It is therefore a great advantage to be able to dispense with this constituent.

Diphtheria bacilli grow exceedingly well on Gordon and Hine's legumin trypagar,[1] and when this medium is used no sterile serum is necessary. The addition of 0.3 c.cm. of sterile 1 per cent. telluric acid to 10 c.cm. of this agar gives a very satisfactory medium. Plates of this medium are poured, and when set brushed with a dilute emulsion of the growth containing the diphtheria bacilli and incubated at 37° C. for forty-eight hours, by which time the characteristic appearance of the colonies of the different organisms is most distinct.

The majority of organisms other than the diphtheroids reduce the telluric acid and produce blackish colonies; this is very marked with the staphylococci. The streptococci do not reduce the telluric acid, their colonies are characteristically greyish-white, small (usually less than 1 mm. diameter), very flat and very translucent. The colonies of the diphtheroids are greyish-white, semi-translucent, slightly convex, about 1 mm. in diameter, with a slightly darkened central spot. By the use of this medium I have selected as many as five colonies of *B. diphtheriae* in succession from a plate containing numerous colonies of other organisms.

The morphology of the diphtheria bacillus when grown on legumin trypagar differs from its morphology when grown on Loeffler's serum; the bacillus stains more uniformly, the characteristic beads are not evident, and club-shaped forms are common. With a little practice, however, it can readily be recognized and distinguished from Hoffmann's bacillus grown on the same medium. It is unfortunately not possible to distinguish between the colonies of Hoffmann's bacillus and those of true diphtheria bacilli. Douglas's trypsin broth[2] with the addition of pea-flour extract and 0.5 per cent. Witte's peptone (to help toxin production), is very suitable for the cultivation of *B. diphtheriae* for animal inoculation. Almost invariably a good growth is obtained—an essential condition of the experiment—while with ordinary broth this is far from being the case, the growth more often being only scanty. Glucose litmus legumin trypsin broth is very suitable for the observation of acid productions from this sugar.

REFERENCE.

[1] Vide BRITISH MEDICAL JOURNAL, November 18th, 1916; also Reports of the Medical Research Council, Special Report Series No. 19. [2] Loc. cit.

A SMALL Italian surgical hospital with an out-patient department has been opened at Aleppo by the National Italian Association.

THE sixteenth Congress of the German Orthopaedic Society will be held in Berlin from May 18th to 20th, when the principal subjects for discussion will be bone and joint tuberculosis and rickets.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

PREVENTION OF INTESTINAL OBSTRUCTION AFTER VENTROFIXATION.

In the *Epitome of Current Medical Literature* of the JOURNAL of February 12th there occurs a paragraph (No. 216) on "Intestinal Obstruction after Ventrofixation of the Uterus," by Hastrup, from *Ugeskrift for Laeger* of December 30th, 1920. After losing a patient, on whom I had operated, owing to obstruction of an intestinal loop, I have always closed the space between the retroflexed uterus and the bladder before fixing the uterus, in the following way: The whole of the bladder surface of the body of the uterus, from the fundus down to the line of reflexion of the bladder, is bared of its peritoneal covering by dissecting back two flaps as in the figure. At first I dissected similar flaps on the bladder, but this part was more difficult and is not necessary. The bared uterus is next united to the bladder and peritoneum above by central catgut sutures. These are of fine gut, and care must be taken not to put the bladder sutures too deep. A continuous catgut suture next unites the dissected flaps all round from bladder reflexion on one side to the other over the fundus. The rest of the operation is done in the usual way.

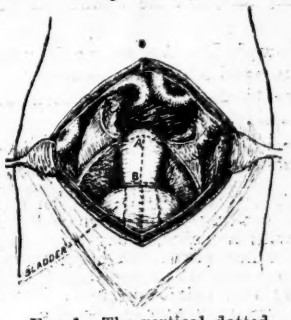


FIG. 1.—The vertical dotted line A B is on the uterus, with limbs at A and B to show flaps of peritoneum reflected. Curves and knots above show the lines of suture of uterus to bladder and abdominal wall (catgut). Two or three strong silkworm-gut sutures fix fundus above A to wall.

I have had only one opportunity of seeing the late result, and there instead of the usual band there was a broad ligament supporting the uterus. There has been no return of prolapse, though usually no vaginal operation has been done, and several have borne children with no difficulty, and no return of the prolapse. I have no doubt others will have done the same operation, but from the abstract in the *Epitome* the method does not seem to be well known. It can, of course, be combined with operative treatment on the round ligaments, but I have not considered both necessary.

Aberdeen. ALEXANDER DON, C.M., F.R.C.S.Ed.

AMŒBIC DYSENTERY COMPLICATING MALIGNANT DISEASE OF THE LOWER BOWEL.

THE following case is of some interest from the fact that *Entamoeba histolytica* was found microscopically four months prior to death from carcinoma of the pelvic colon.

C. L., a ship's painter, aged 41, who had never been in the tropics, was admitted to Queen Mary's Hospital for the East End on October 10th, 1920, suffering from diarrhœa with blood and mucus. He first had diarrhœa and colicky pains four months previously, but he continued work down to three weeks before admission. His physique was good, but he appeared slightly anæmic; the tongue was slightly furred; he had an upper denture, the lower teeth were good, and he had no lead line on the gums. The heart and lungs were normal. The abdomen was rather full and tympanitic, with tenderness in the left iliac fossa. The liver and spleen were not enlarged nor tender; there was no pain on micturition. Urine, specific gravity 1022, acid, and free from albumin. The stools were pale and watery, containing large jelly-like masses and shreds of blood-stained tissue. Temperature 98.6°, rising to 99.2° in the evening. The bacteriologist reported the presence of free amœbae of *E. histolytica* type. Plates were negative for *B. dysenteriæ*. Sigmoidoscopic examination showed the mucous membrane pale, but no ulceration or inflammation of bowel within 9 in. of anus.

Emetine bismuth iodide, grains 3, was prescribed; twelve doses were taken from October 18th to October 30th; the lower bowel was irrigated with ensol, half-strength, daily. The condition did not materially improve, and two courses of emetine hydrochloride injections, gr. 1/3, were given in November and December. On December 12th the bacteriologist reported that the stools were very fluid, without blood or mucus; no amœbae or cysts were found, and there was no cellular exudate.

The diarrhœa persisted with occasional mucus and blood, and the patient was losing weight and becoming cachectic, de Morgan spots were seen on the body, the skin was atrophic, and the tongue furred. Rectal examination showed ballooning, but no growth could be felt. The abdomen, when examined on January 12th, 1921, was soft and flabby with wasted muscles; a firm nodular tumour the size of a Tangerine orange, slightly movable, but adherent to the pelvic structures, was palpable just above the pubis. The lower edge could not be reached. Laparotomy was performed by Mr. Cousins on January 14th. A large malignant mass was found in the lower abdomen involving the descending and pelvic colon, a loop of small intestine, and the base of the bladder. An anastomosis of the small gut into the transverse colon was performed and the abdomen closed. Later there was some amelioration of the symptoms, but death occurred on February 16th.

The autopsy revealed a large malignant growth encircling the bowel about ten inches from the anus, extending upwards and involving about four inches of large bowel. The primary growth showed necrotic changes, and numerous elongated shreds of growth, with which was mixed dark clotted blood. No mucus was discovered. A coil of small intestine three feet above the cæcum had become invaded by growth and its lumen almost occluded. The primary growth encircling the large bowel had not caused obstruction. The growth was adherent to the bladder but had not ulcerated through. Secondary deposits were found in the mesentery of the small bowel but not in the liver. The anastomosis was soundly healed and functioning. The liver showed fatty changes and was very bile-stained. There was no jaundice.

I consider that the malignant disease was not of recent origin, and that it was present at the time he had his first symptoms, seven months before death. The amœbic dysentery was merely a complication, and probably had no bearing on the causation of the growth. However, the fact that *Entamœba histolytica* was found four months before death made the case unusual and obscured the real diagnosis. I have to thank Dr. Troup, under whom the patient first was, and Mr. Cousins, for their kindness in allowing me to publish this case.

JENNER HOSKIN, M.R.C.P.,
Honorary Physician, Queen Mary's Hospital for the East End.

Reports of Societies.

DIGESTION OF THE OESOPHAGUS.

AT a meeting on March 18th of the Royal Medico-Chirurgical Society of Glasgow a communication was made on "Digestion of the oesophagus as a cause of post-operative and other forms of haematemesis," by Mr. J. HOGARTH PRINGLE, Dr. LAURENCE T. STEWART, and Professor J. H. TEACHER. Post-operative haematemesis, they said, was a symptom of great importance to the practical surgeon, and associated with serious danger to the patient. In recorded cases various explanations were given, but digestion of the oesophagus was not mentioned. A few cases of *intra vitam* oesophagomalacia and ulcus a digestione had been recorded, and in July, 1914, Glynn demonstrated to the Pathological Society of Great Britain and Ireland sections of the oesophagus which showed ulceration and inflammatory reaction.

Prior to January, 1914, one of the authors had seen two cases of destruction of the lower part of the oesophagus which looked as if this might have commenced during life. Then a case occurred, under the care of Mr. Pringle, in which vomiting of brown material was observed after operation and about thirty-six hours before death. There was also complaint of pain behind the sternum. No cause of these symptoms except digestion of the oesophagus (which had not gone the length of perforation) could be made out, and the observation then ceased to be a pathological curiosity and became a matter of practical importance. In 1919 the authors made a communication to the *British Journal of Surgery* (vol. vi, No. 24, p. 523) on this subject in which they described a number of cases in which digestion of the oesophagus appeared to have been the cause of haematemesis or vomiting of brown or black material and in some cases the cause of death. Several of the cases in the series were not surgical but medical cases—for instance, anthrax, pneumonia, puerperal eclampsia. On clinical and morbid anatomical grounds the digestion of the oesophagus was regarded as a vital phenomenon. Sections from a number of these cases were shown to the Pathological Society at the meeting in Leeds in January,

1921, and full publication would later be made in the *Journal of Pathology and Bacteriology*.

Intra vitam digestion of the oesophagus was supposed to arise in the following manner. Vomiting of active gastric juice occurred, but the oesophagus failed to clear itself and some of the fluid remained in it, accumulating particularly just above the cardiac sphincter, in which region the injury to the tube was usually most advanced. In post-operative haematemesis the fluid ejected was usually extremely acid, and those patients who were sufficiently conscious to be able to express themselves frequently complained of the scalding effect which it had upon the throat and lips. The lesions produced before death by gastric juice which has escaped into and lain in the oesophagus were apt to be more or less obliterated by changes due to continuation of the digestion after death. In twelve of the fifteen cases which were described in 1919, and in four new ones, however, microscopic examination had revealed unmistakable signs of vital reaction, in the form of abundant leucocytic infiltration of the mucous membrane and other tissues, congestion of blood vessels, accumulation of leucocytes in the vessels, thrombosis, and inflammatory oedema. The picture was that of an acute ulceration. It was easier to recognize these changes than to assess the extent to which they might have been obscured or obliterated by continuation of digestion, or to decide the relative amounts in which that digestion was a continuation of the lesion which developed during life or a *post-mortem* change. Probably these cases had been observed, but the lesions had been put down as merely *post-mortem* digestion, from which, however, it was not now difficult to distinguish them. It was therefore clear that digestion of the oesophagus during life did occur; that it might be the cause of death; that it occurred in other than operation cases, and that it might be arrested and healing take place. Its occurrence was shown by haematemesis, and in some cases by pain behind the sternum. It was therefore open to diagnosis and in some cases at any rate must be amenable to treatment. The commencement of healing had been recognized in two specimens.

In most of the cases recorded in the *Journal of Surgery* the digestion probably began not more than thirty-six hours before the death of the patient; in some cases the duration was much less, reckoning from the occurrence of the haematemesis. The morbid anatomy of the cases showed great variation—from a slight condition in which the phenomena were superficial erosion of the mucous membrane, with haemorrhages into the affected tissue and black fluid in the oesophagus, to cases in which perforation or extreme maceration of the lower third of the oesophagus and extensive digestion of the adjacent surfaces of the lungs had taken place. Nine examples of the most advanced type, five severe but not perforated, and five slighter lesions had been observed—seventeen of them since January, 1914. A most important diagnostic feature available at autopsy was the relatively slight change in the stomach, which might show only slight *post-mortem* digestion or a total absence of that condition, contrasting with advanced digestion of the oesophagus immediately above the cardiac ring. In most cases, at least of the severer types, there was a well marked zone of deep ulceration immediately above the cardiac ring. At a varying distance above this the changes were less of the nature of destruction, the predominant features being superficial erosion and haemorrhages into the mucous membrane, such as were seen in the slight cases. Signs of reaction might be unrecognizable or very slight in the lower parts, but well marked in sections prepared from the upper parts of the damaged oesophagus.

The communication was illustrated by specimens, sections, and lantern slides.

Mr. J. MILL RENTON read a paper on "The surgical treatment of sciatica," which is published in full in our issue of this week, at page 557.

Mr. G. H. EDINGTON read a short account of two cases in which the thoracic duct was wounded in the operation for removal of tuberculous cervical glands:

Case 1.—Early in 1911 he operated on a boy, aged 7, for tuberculous cervical glands involving an extensive dissection on the left side of the neck. The thoracic duct was not seen, and there was nothing unusual in the appearance of the wound at the conclusion of the operation. There was post-operative rise of temperature to over 100° F., and in thirty-six hours the dressings began to be soaked with watery discharge. On the fourth day the wound was opened and fluid sponged out, and the welling of fluid had ceased, but the internal jugular vein was found to be very fragile. There was no pus in the wound, and the muscles were peculiarly clean and bare. Death took place on the night of the sixth day, with a copious flow of blood from the wound.

Case 2.—In the summer of 1920 he operated on a lady aged 28. Extensive dissection on the left side of the neck was required, but the thoracic duct was not identified. The following day there was copious watery discharge, and two days later there was ballooning of the lower part of the neck, and through the lower incision there spouted fluid like whey of a pale greenish colour. The temperature rose to 101° F., and as milky fluid continued to pour out, the cavity in the posterior triangle was packed with gauze. The tissues in this case also were macerated. After the firm packing of the posterior triangle the milky discharge became gradually less, and the wound healed without further event.

In the discussion that followed, Mr. ARCHIBALD YOUNG recorded a third case of a man, aged 52, whom he operated on in 1910 for a very extensive tuberculous involvement of the cervical glands on the left side.

Dissection of the glands was carried out laboriously and with much difficulty, and the sterno-mastoid muscle, part of the parotid gland and part of the internal jugular vein were removed in course of the operation. During the operation Mr. Young became aware, through soaking of his gown and the sheets on the operating table with a glairy, sticky fluid, that injury of the thoracic duct had taken place. An attempt was made to find the injured duct, but without success, and in the end recourse was had to packing with iodoform gauze. From the time of the operation there was no further escape of chyle, and on the removal of the packing, which was not disturbed for several days, it was found to be soaked with serum only. The recovery was uneventful.

INDICATIONS FOR BLOOD TRANSFUSION.

AT a meeting of the Liverpool Medical Institution held on March 31st, with the Vice-President, Mr. THURSTAN HOLLAND, in the chair, Mr. W. BLAIR BELL discussed the indications for blood transfusion, giving illustrative cases. He divided the conditions for which blood transfusion is required into three main groups with subdivisions.

Group A contains those cases in which there is loss of all the constituents of the blood from an acute large haemorrhage, or the loss of the solid constituents which occurs in chronic limited haemorrhages, or in which there is considerable loss of fluid associated with shock. *Group B* contains those cases in which there is absent from the blood some constituent present in normal circumstances, or one usually formed in response to specific stimulation. In this group are such conditions as haemophilia, in which disease operations may safely be performed immediately after blood transfusion. Included also are cases of eclampsia, in the blood of which a chemical antibody to placental toxin is believed to be absent, and acute and chronic infections in which the patient's own bacterial antibodies are insufficient. *Group C* contains those diseases in which there is blood destruction. Although good results are claimed for the treatment by blood transfusion of pernicious anaemia, it is probable that the result is only temporary and that transfusion must often be repeated.

A short account was given of the blood grouping of donors of blood and of the problems which may be connected with the grouping, such as the heteroplastic grafting of tissues and selective sterility. Mr. Blair Bell discussed finally the various methods of blood transfusion, and emphasized the fact that the citrated blood method is the only generally applicable and safe procedure. He then described his own apparatus by means of which the blood of the donors is automatically citrated as it leaves the vein, and all the fluids are kept at body temperature during the necessary steps in the operation. He demonstrated this apparatus to the meeting.

Dr. JOHN HAY read a paper dealing with the prognosis in patients presenting a rapid heart action. Patients with rapid action of the heart could be classed in two groups: (1) those in whom the rhythm was physiological, and (2) those in whom it was pathological. In the first group the rapid action was secondary to such causes as emotion, effort, toxins, etc., and the prognosis depended on an accurate recognition of the primary cause. Special reference was made to the rapid action in patients suffering from aortic regurgitation and also to the apyretic tachycardia of early tuberculosis. The combination of

functional and organic diseases of the heart was discussed. In the second group three conditions were briefly discussed: paroxysmal tachycardia, auricular flutter, and auricular fibrillation, and typical cases were described. The prognosis, both immediate and remote, was carefully considered in each patient and the general principles defined on which prognosis depended.

A NEW ANAESTHETIC.

AT a meeting of the Section of Anaesthetics of the Royal Society of Medicine, held on April 1st, with Dr. H. J. SHIRLEY, C.M.G., President, in the chair, Dr. R. L. MACKENZIE WALLIS and Dr. C. LANGTON HEWER read a paper on a new general anaesthetic, its theory and practice. Dr. Wallis described the impurities of ordinary ether and previous efforts at the production of ether free from impurities to which harmful effects may be attributed. He alluded to the work of Cotton and to the uselessness of absolutely pure ether as an anaesthetic. The ether which he has prepared, after many different processes had been tried, is distinguished by being free from mercaptans, while it contains the higher ketones, some carbon dioxide, and some ethylene, perfectly pure ether being the vehicle. In the production of this pure ether, permanganate and copper sulphate are employed. The new ether keeps better than the ordinary liquid. The carbon dioxide appears to exercise a stabilizing influence.

Dr. HEWER said that the new agent was less irritating than ordinary ether and stimulated the respiratory system less. He had used it on the patients suffering from bronchitis, none of whom suffered any aggravation of their symptoms. The blood pressure effects were between those of chloroform and of ether. The drop after operation and before consciousness was less than with ether. It had been used successfully on patients with diseased hearts. No ill effects had followed its use with three diabetic patients and with a child who was passing large amounts of acetone. There was absence of taste and smell afterwards and much less liability to vomit. The methods employed had been those usual with ether. Mostly he had used the new agent in connexion with continuous gas and oxygen. It is made by Savory and Moore under the name "ethanesal." Subsequent speakers bore testimony to the satisfactory anaesthesia and-freedom from after-effects which they had experienced with ethanesal. It had been used in about 250 cases.

AT a meeting of the Laryngological Section of the Royal Society of Medicine on April 1st, with Dr. JOBSON HORNE in the chair, Mr. ARCHER RYLAND gave an epidiascopic demonstration illustrating a case of pharyngeal pouch dated 1760. Some members doubted whether it was a true pharyngeal pouch, as it was covered by muscular fibres, so that it might more accurately be regarded as a dilatation of the lower part of the deep pharynx. Mr. G. W. DAWSON showed a case of large dental cyst. In the discussion, Mr. STUART LOW doubted if it would heal up without further treatment, and suggested painting the cavity with strong zinc chloride. Dr. DAN MCKENZIE thought that a plastic operation would be necessary. Mr. DAWSON also showed a girl with a retention cyst of the floor of the left nostril. Mr. C. W. M. HOPE showed a patient with a tumour growing from the right supratonsillar fossa. It was agreed that this was probably composed of ordinary tonsillar tissue, and several similar cases were cited. Dr. DAN MCKENZIE showed a case of scarring of the pharynx following scarlet fever many years before, the uvula being moved by contraction to the right side of the palate. Mr. M. VLASTO showed a case of bilateral abductor paresis of the vocal cords. Several members advocated tracheotomy, and Mr. F. HOBDAY, as a result of his veterinary experience, suggested an operation similar to the ventricle stripping performed on "roaring" horses. Mr. PHILIP FRANKLIN showed a case of demicyclops, or lateral nasal proboscis, in a male infant 7 weeks old, and demonstrated the embryological abnormality that had probably occurred to account for the condition. The main points that he called attention to in the case were the absence of the premaxilla, the movement of the appendage, the perforation of the free end, and the secretion of salty fluid. Mr. JEFFERSON FAULDER showed two laryngeal cases for diagnosis, in both of which there was a tumour springing from the region of the ventricular band. They were thought, after some discussion, to be non-malignant.

Reviews.

THE PHYSIOLOGY OF BONE.

IN his treatise on *Bone Formation*[1] which Dr. MURK JANSEN of Leyden has done us the compliment to write in English, he advances very convincing evidence that tension does not exert any trophic influence on bone. His contention is the result of a careful and extensive study of sections, taken in various planes, of normal and abnormal bones, and his interpretation of the conditions observed prove that he has a very keen appreciation of the close affinity between structure and function.

It is shown, from a study of the neck of the femur in coxa vara, that there is a contrast between the effect of pressure which leads to thickening of the bone elements and tension which produces a thinning of the same elements. A similar contrast is demonstrated in normal bones from several parts of the body and in other pathological conditions. Dr. Jansen explains how previous workers in this field have erroneously ascribed the formation of bone to tension stresses, without taking into account dynamic stresses evoked by muscular action, and cites several examples which show that tension has been assumed in parts of bones exposed to pressure from muscular action.

After surveying the relation of function to the structure of the cancellous tissue in various parts, the author concludes that it is composed of bone elements which coincide with pressure stresses caused directly by muscular action and body weight; and he brings forward evidence to prove that wherever pressure is displaced by tension, atrophy of the cancellous tissue is found. Throughout the book just and arresting criticism, supported by original observations, is levelled at the assumption that tension may promote bone formation. It appears clear that too great emphasis has been laid in the past upon the effect of the purely mechanical forces acting upon bone, and Dr. Jansen undoubtedly brings us back to the living bone and its function; for this reason a study of *Bone Formation* is both refreshing and stimulating, and its facts and arguments will prove of great interest and importance to a wide circle of readers. It is a book from which all anatomists, physiologists, and surgeons may gain inspiration, and even if only a proportion of its readers are prepared fully to accept the doctrine that "to pressure only a trophic effect on bone tissue has been assigned," all will find themselves influenced by the striking and significant observations made, and be stimulated to look a little deeper into the orthodox teaching on this subject. The book is well and freely illustrated, and a credit to the publishers.

DISEASES OF CHILDREN.

IN the third edition of his well known book, *The Clinical Study and Treatment of Sick Children*,[2] Dr. JOHN THOMSON has taken the opportunity of rewriting the whole and of reviewing all that is best in paediatric literature during the last ten or twelve years. It is quite evident that Dr. Thomson has read very extensively, and that nothing of value has escaped his notice. There may be other books published in this country which make reference in more or less detail to the great and increasing literature—British, Continental, and American—of this department of medicine, but there is no other that provides the reader with the opportunity of seeing it passed in review by a teacher so experienced and of such ripe judgement. For example, Chapter XXII, entitled "On Spasmophilia," gives an admirable account of a condition which for want of separate consideration has been somewhat obscured in textbooks published in this country. The contents of Chapter IX, "On Food Disorders," are subdivided as follows: "Work of Czerny and Keller, and of Finkelstein; Finkelstein's classification; stages of disturbance of equilibrium, dyspepsia, decomposition and intoxication. Causes, symptoms, treat-

[1] *On Bone Formation: Its Relation to Tension and Pressure.* By Dr. Murk Jansen, O.B.E., Lecturer on Orthopaedic Surgery, University of Leyden (Holland). Manchester: The University Press. 1920. (Roy. 8vo, pp. 114; 54 figures. 20s. net.)

[2] *The Clinical Study and Treatment of Sick Children.* By John Thomson, M.D., F.R.C.P.Edin. Third edition, rewritten and greatly enlarged. Edinburgh and London: Oliver and Boyd, 1921. (Med. 8vo, pp. 907; 249 figures. 32s. 6d. net.)

ment. Digestive disturbances from other causes. Diarrhœa from defective nursing; from infection, enteral and parenteral (causes, diagnosis, treatment). Idiosyncrasy for cow's milk." This cosmopolitan outlook is a feature of the book which is very welcome.

Dr. Thomson's sober review of these matters will help to break a way through the strange barrier which seems to exist between the literature of this country and that of others in the subject of paediatrics. In its treatment of the great volume of recent work by English authors the book is no less satisfactory. Chapter XXIV, "On the Heart and Circulation," admirably combines the new learning and the old. References to original papers are provided throughout (in footnotes). The value of the book, however, is much greater than that of a review, however judicious, of current literature. It bears the impress on every page of the author's long experience and great powers of observation. Moreover, Dr. Thomson has succeeded in presenting his material in a form which differs from that which has become stereotyped by its adoption in a long succession of textbooks. While it contains all that a student or practitioner may expect to find in it, the book is truly, as its title indicates, a series of clinical studies.

A lifelong study of the ailments of children enables the author to use very clear and convincing language upon many matters which have not before been made plain. Thus it is usually taught that asthma is not a common disease in early childhood. Upon page 54 is a diagram showing the age of onset in 100 cases. In 60 per cent. the onset was within the first four years of life, in 86 per cent. within the first seven years, in 12 per cent. the disease was already established within the first year. Again, the author makes plain the very great improvement which may be looked for in many cases of spastic diplegia due to cerebral birth injury—cases in which the stiff expressionless face, the speech defect, and the constant dribbling of saliva have given rise to an exaggerated estimate of the degree of mental impairment present. With both of these statements we are in hearty agreement. We believe that it might reasonably be argued that in asthma we have, in most cases, a perpetuation of an infantile neuro-muscular inco-ordination, the disappearance or persistence of which is in great measure determined by the success or failure of the disciplinary and moral education of the child, and that the cerebral damage which gave rise to the spastic diplegia, in many cases, produces only a motor defect, leaving the receptive side of the brain unimpaired, although for long unstimulated because of the motor abnormality.

In a book so full of clear and precise, though guarded, statement there is little which invites criticism. We doubt if it is true that "a child should not usually be allowed to bathe in the sea until he is six or eight years old"; but perhaps Dr. Thomson has in mind the frigid seas of his own east coast of Scotland. We think that the short paragraph entitled "Practical Details regarding Breast Nursing" might profitably have been expanded into the most important chapter in the book. The numerous illustrations are excellent. Such plates as those illustrating "The facies in pleuropneumonia before and after the crisis" (p. 7), "Chorea at the onset and in convalescence" (p. 590), and "Nodules in the scalp in rheumatic fever" (p. 735), are an advance upon what is commonly achieved.

Dr. Thomson's book will be of real service to the practitioner and to the student of medicine. So long as the subject of paediatrics is crowded out of the medical curriculum, we must look to books such as this to repair the damage, and, so far as may be possible, to keep alive interest in and to spread understanding of a subject of unequalled importance to the community and the race.

TREATMENT OF VENEREAL DISEASE.

THE fourth edition of Marshall's *Syphilis and Venereal Disease*[3] appears under the joint authorship of C. F. MARSHALL and E. G. FFRENCH. The book has been thoroughly revised throughout and much new matter added, especially in the sections dealing with treatment. New plates have been inserted and the work is well illustrated, although we should have welcomed a few more illustrations in the chapters devoted to syphilis of the eye and of other special regions of the body. In discussing treatment the authors make a special plea for the internal administration of mercury, a method that has been disparagingly referred to by some writers as the "pill treatment." They point out, in support of their views, that:

> The two syphilologists who have probably treated the greatest number of cases—Sir Jonathan Hutchinson and Professor Alfred Fournier—employed this method in the great majority of their cases. Further, as these two syphilologists have enjoyed an unusual span of active professional life, they have been able to follow up their cases to an extent which is denied to most of us and have shown that the proportion of tertiary syphilis occurring among their cases after prolonged internal treatment is small, and compares favourably with that of other methods. In fact, the most reliable statistics we have concerning the frequency of tertiary syphilis (those of Fournier) are based on cases which were, for the most part, treated by ingestion. Hence the incidence of tertiary syphilis appears to depend less on the method than on the duration of mercurial treatment.

In the section describing exfoliative dermatitis resulting from arsenical preparations the authors consider cold or exposure an important etiological factor. During several years' experience in India and London only four cases of severe dermatitis were observed, but during service in France some twenty cases came under observation. The authors suggest that the majority of these cases were due to exposure to cold. They do not, however, give details as to the amount and intensity of the treatment to which these patients had been subjected. Intramine is recommended as the best remedy available for such cases. In the chapter on inherited syphilis several of the illustrations are reproduced from Findlay's excellent little work on *Syphilis in Childhood*. A chapter is devoted to the subject of chancroid. In the difficult matter of treatment the authors recommend the method of Goubeau. This form of treatment was extensively carried out in the French army and apparently with success. It consists of carefully cleaning the surface of the chancre with a swab soaked in ether and of afterwards applying by means of a brush or a wooden probe wrapped in wool a 1 in 50 alcoholic solution of sodium arsenate.

In the chapter on gonorrhœa the illustrations are mainly taken from Luys's well-known work on that subject. The important question of tests for cure scarcely receives the attention it deserves, only a few lines being devoted to a subject which is surely one of the most vital in the whole of venereal science.

In the final chapter, on venereal disease and public health, the authors come to the conclusion that among the measures calculated to reduce the incidence of venereal disease in the community prophylaxis is of primary importance.

[3] *Syphilis and Venereal Diseases.* For Students and Practitioners. Being the fourth edition of *Syphilology and Venereal Disease.* By C. F. Marshall, M.D., M.Sc., F.R.C.S., and E. G. Ffrench, M.D., Ch.B., F.R.C.S.Edin. London: Bailliere, Tindall, and Cox. 1921. (Demy 8vo, pp. 446: 90 figures, 9 plates. 25s. net.)

THE QUANTITATIVE STUDY OF METABOLISM.

ALTHOUGH long before the war the quantitative study of metabolism had been enriched by the contributions of many physiologists, it is certain that the war-time stringency of food conditions encouraged many to undertake this kind of research who were previously deterred both by the apparent difficulty of the technique and the improbability of attaining any results of dramatic interest. But the researches of Haldane, Pembrey, and Douglas had placed at the disposal of the investigator a method which did not involve the provision of a large quantity of expensive apparatus, and which could be accurately employed by any person who had had a general scientific training and a few months' special instruction. The system to be recommended was succinctly described by Cathcart in a paper which appeared in the *Journal of the Royal Army Medical Corps*, November, 1918, and several English workers reported observations upon the metabolism of healthy adults under varying conditions. For the most part, the circumstances in which these observations were made precluded accurate study of the basal rate, a function which has been elaborately measured by American physiologists, although Cathcart and Orr were able to report upon the post-absorptive rates of a sample of healthy adults. It was obvious that variations of the basal rate in health and disease would repay further investigation, and Drs. BOOTHBY

and SANDIFORD[4] have been well advised to issue a manual for the service of those who wish to introduce calorimetry into the sphere of clinical research.

The authors have had wide experience of clinical calorimetry at the Mayo Clinic, and remark that: "In the treatment of the large number of thyroid cases seen at the clinic our results have definitely shown how essential is the knowledge of the basal metabolic rate in pathologic conditions of the thyroid. It is as essential as a knowledge of the temperature in febrile cases." The volume is avowedly a laboratory manual, and does not deal with the clinical interpretation of results. The technique described and advocated is essentially the same as that of Haldane and Douglas, of Cathcart and Orr, and of other recent English workers, with the modifications imposed by its application to persons at rest in bed. The only substantial change is the employment of a gasometer for measuring the volume of expired air, instead of the rougher and handier method of expressing the contents of a bag through a meter. Whether the gain in precision more than compensates the loss of simplicity must be decided by future experience. The authors describe each step of the routine clearly and fully, and provide tables which will be found very useful by the computer.

We think it well to conclude upon a note of warning. There is an old legal motto that he who seeks equity must do equity, which has an application here. Those who desire to ground clinical or physiological inferences upon quantitative measurements must give heed to the determination and limits of accuracy of their "normal" standards. Quite recently Harris and Benedict called attention to the weakness of some arithmetical arguments which have passed current in physiological circles. Perhaps the criticisms of the last-mentioned authors were in some particulars over-emphasized, but of the importance of the principle for which they contended we entertain no doubt. We no not believe that this method will be of value as a routine procedure until the discussion of the statistical significance of normal variations of basal metabolism initiated by Benedict and Harris has been carried a good deal further.

A TEXTBOOK OF DERMATOLOGY.

DR. MACLEOD'S *Diseases of the Skin*[5] is one of the most important works on dermatology produced in this country in recent years. During the period that Dr. MacLeod has worked at his subject he has not neglected to study the writings of his colleagues and contemporaries; to this the present volume bears ample witness. References will be found therein to almost all the principal modern contributions to dermatology, although the author states that owing to the exigencies of space the bibliographies have been restricted. This textbook is, however, by no means a mere compilation, for although the author has done full justice to the work of others his own individuality and personal standpoint are visible from start to finish.

The book is singularly complete, for after a fairly exhaustive examination we have not detected any really important omission; another merit is that the amount of space allotted to the various subjects is very well adjusted to their relative degrees of importance. Dermatology is notoriously a subject overlaid with masses of detail, and to a large extent consists of the record of isolated facts which as yet do not admit of satisfactory classification. But while as a collector of facts and descriptions Dr. MacLeod need fear no comparison even with the Teuton, he has not allowed them to obscure his clarity of thought, and he has been able to maintain a unified conception of the whole field of his art. We would particularly commend to the student a perusal of the chapters comprising Part I, which includes the sections on general pathology, diagnosis, and treatment, both internal and local. They are full of sound principle and reasonable advice. Consideration of them will tend to steady the therapeutic head and prevent over-confidence in the claims of so-called "specifics" which from time to time become prominent in the dermatological world. But, in classifying local medicaments into therapeutic groups, Dr. MacLeod should give more prominence to the protectives group, for these, which consist (as he states) of bland powders, thick ointments, and occlusive dressings, are the most important class of local therapeutic agents for application to the skin. The skin itself has for its chief function the protection of the underlying structures, and when it becomes inflamed it needs above all things protection itself in order to give the physiological rest which is the first rule in the treatment of inflamed organs. In the list of local medicaments in common use in dermatological practice there is, too, one curious omission, namely, zinc. Is it possible to practise the treatment of skin diseases at the present time without employing that metal either as an ointment, lotion, or powder?

No satisfactory classification of diseases of the skin has yet been devised. In this volume the etiological system is followed as far as possible, but when that has been pushed to its utmost limit there remain a host of conditions as to the causation of which nothing is known, and a place has to be found for them. Dr. MacLeod has grouped them to some extent regionally in chapters on affections of the hair, of the nails, of the lips, etc. He has also three very excellent chapters on neoplasms—one on benign neoplasms, another on malignant neoplasms, and a third on pseudo-neoplasms, under which term he groups the various forms of xanthoma, sclerodermia, and calcareous deposits. These three chapters may be especially recommended to the attention of young surgeons and pathologists. They are well illustrated by drawings made by the author's pencil from his own sections. As one of the few British dermatologists who has made his mark in pathology he perhaps shines more particularly in this branch of the subject. Finally, there is a chapter devoted to tropical affections of the skin; this includes a miscellaneous collection of conditions which have in common simply the fact that they occur in warm climates. Many of these might well have been grouped more scientifically, for their etiology is well known; this is true, for example, of oriental sore, framboesia and others. A minor fault in the classification is the inclusion of Schamberg's disease under congenital abnormalities. Not many dermatologists will admit that this is a correct view of that singular condition.

Illustrations form an important part of any textbook of dermatology, and they have been lavishly provided in the present instance. Curiously enough, the monochrome photographs, on the whole, are of a far higher standard and give a much better idea of the conditions they depict than do the coloured plates, which have apparently been made from drawings, not from photographs. Too much stress is laid upon the necessity of having books on dermatology illustrated in colour; very often the coloured illustrations fail to give a better idea of the lesions described than ordinary photographs, and sometimes they are positively fallacious. To be really useful they must be made either from the very best photo-transparencies, preferably Lumiere autochromes, or from coloured drawings executed with a very great deal of labour by a highly skilled artist who has more time to give to the task than is usually available.

The literary style of the book is good; it is very readable, and the descriptions are often very happy. The author is to be congratulated on his work, which is a credit to British dermatology.

HYPNOTISM.

IN *An Introduction to the Study of Hypnotism, Experimental and Therapeutic*,[6] by Dr. H. E. WINGFIELD, the practitioner who wishes to utilize this form of treatment will find a useful guide. The book is clearly written and essentially practical. The earlier chapters are devoted to definitions, the conception of the subconscious, the methods of inducing hypnosis, and the various phenomena of the hypnotic state. These more theoretical matters are followed by a long chapter in which the question of treatment by hypnotic suggestion is discussed. While the author has found hypnotism to be a valuable therapeutic agent in a number of nervous conditions, he is fully alive

[4] *Laboratory Manual of the Technic of Basal Metabolic Rate Determinations.* By Walter M. Boothby, A.M., M.D., and Irene Sandiford, Ph.D. Philadelphia and London: W. B. Saunders Company. 1920. (Med. 8vo, pp. 117; 13 figures. 24s. net.)

[5] *Diseases of the Skin.* A Textbook for Students and Practitioners. By J. M. H. MacLeod, M.D., F.R.C.P.Lond. London: H. K. Lewis and Co., Ltd. 1920. (Roy. 8vo, pp. 1327; 24 colour plates, 435 figures in black and white. £3 10s. net.)

[6] *An Introduction to the Study of Hypnotism, Experimental and Therapeutic.* By H. E. Wingfield, M.A., M.D., B.Ch.Cantab. Second edition. London: Baillière, Tindall, and Cox. 1920. (Crown 8vo, pp. viii + 195. 7s. 6d. net.)

to its limitations, and writes with balance and restraint. Especially does he lay stress on the thesis that, though hypnotism may do much to begin a cure, the ultimate result must depend upon the personality factor. He shows that many nervous conditions are the product of an unhealthy manner of life, that the patient must himself strive to overcome his tendencies to indolence and self-indulgence, and that only by an endeavour to face the realities of life will he succeed in contributing his share to the welfare of the community.

PREVENTION OF COMMUNICABLE DISEASES.

MANY authors have written upon preventable diseases, but hardly one has dealt with the subject in such a thorough and comprehensive manner as Dr. FRANCIS M. MUNSON in his *Hygiene of Communicable Diseases*.[7] It deals not only with such infectious diseases as measles and scarlet fever, but with many other ailments which are best described as communicable. Its scope is further shown by the author's statement that successful defence against infection is much more a personal affair than it was formerly considered, and that individuals can and must protect themselves. "If," he writes, "people practised reasonable cleanliness and put nothing in their mouths except what belonged there, most communicable diseases would be avoided." Cleanliness and disinfection are so nearly allied that we turn with interest to the chapter in which Dr. Munson deals with the latter. He describes the ordinary methods of disinfection, but considers that disinfection after a case of measles, diphtheria or scarlet fever is largely unnecessary, and that it is a waste of time, energy and money to attempt to disinfect the air of a sick-room while it is in occupation.

The chapter upon railway sanitation deals with the American Interstate Quarantine Regulations, which are so crowded with detailed instructions to railway employees and passengers that their very multiplicity seems calculated to defeat the object for which they were made. The all-embracing nature of these regulations may be gathered from the inclusion in them of sections dealing with the disinfection of shaving brushes as a safeguard against anthrax.

A very useful chapter is that concerned with the sanitary measures to be taken after great disasters such as floods, fires, and earthquakes. Very practical and well considered advice is given as to the improvization of water supplies, the emergency removal of refuse, and the promulgation of sanitary regulations in the event of the occurrence of such disasters. The author enumerates several measures which in his opinion are among those essential for the prevention of venereal diseases. These include education in matters of sexual hygiene, provision for accurate and early diagnosis and treatment, repression of prostitution by the police, restriction of the sale of alcoholic beverages, abandonment of the use of common towels in public places, and personal prophylaxis by those who expose themselves to the risk of infection. On the debatable question of compulsory notification of cases to the sanitary authority he is silent. Although obviously written for American readers the book will be of value to public health officers on this side of the Atlantic, if only because it will enable them to compare American administrative procedure with British, and not always to the advantage of the latter.

NOTES ON BOOKS.

THE fortieth volume of the *Transactions of the Ophthalmological Society of the United Kingdom*[8] contains the proceedings of the Society during the session 1919-20, and those also of certain other bodies affiliated with it. In addition to individual papers the two discussions held by the Society are reported at length—the one on diabetes in relation to diseases of the eye, and the other on the prevention and treatment of ophthalmia neonatorum. It may be remembered that at the end of this discussion the Society adopted a resolution asking the Metropolitan Asylums Board, in view of the large number of cases of ophthalmia neonatorum congregated at St. Margaret's Hospital, to afford facilities at that hospital for teaching medical students, midwives, and district nurses the natural history and treatment of the disease. The report of the council of the Society calls attention to the increased cost of publishing and printing; in consequence the annual subscription has been increased to 31s. 6d., and a reserve fund for publication, to which gifts are invited, has been established. Of the affiliated societies whose proceedings are embodied in the volume the first is the Oxford Ophthalmological Congress of 1920. The material published from this congress includes the Doyne memorial lecture on the nerve paths and centres concerned with sight, delivered by Mr. Richardson Cross of Bristol. The other societies whose proceedings are reported are the Midland, the North of England, the Irish, and the Egyptian Ophthalmological Societies. The last fifty-six pages of the volume are occupied by a general index to the *Transactions* of the Ophthalmological Society for the ten years 1911-20. The preparation of this index has, it is stated, led to some delay in the publication of the volume.

The eleventh edition of the well-known ambulance handbook, by Drs. WARWICK and TUNSTALL, entitled *First Aid to the Injured and Sick*,[9] brings this little volume into its 150th thousand. The text and illustrations have been revised, and the new edition should maintain the popularity which this work has earned during the twenty years it has been before the public.

A small manual, *Serbo-Croatian Self-taught*,[10] by Mr. JOHN O'BEIRNE, has now been included in the Marlborough Series. Serbo-Croatian is the language of the kingdoms of Serbia and Montenegro, of Bosnia and Herzegovina, of Dalmatia, Croatia, and Slavonia, and of certain parts of the south of Hungary; it is spoken by some nine millions of people. The main distinction between Serbian and Croatian lies in the different alphabets employed. The only other differences between the two are trifling details of dialect and pronunciation. Serbo-Croatian is thus one language with two alphabets. Both renderings are given in this little volume, but all the words are transcribed phonetically.

[7] *Hygiene of Communicable Diseases.* A Handbook for Sanitarians, Medical Officers of the Army and Navy, and General Practitioners. By Francis M. Munson, M.D. New York: Paul B. Hoeber. 1920. (Post 8vo, pp. 807; 36 figures. 5.50 dollars.)

[8] *Transactions of the Ophthalmological Society.* Vol. xl. Session 1920: with list of officers, members, etc. London: J. and A. Churchill. (30s. net.)

[9] *First Aid to the Injured and Sick.* By F. J. Warwick, B.A., M.B., and A. C. Tunstall, M.D., C.M., F.R.C.S. Eleventh edition, revised. Bristol: John Wright and Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1920. (Fcap. 8vo, pp. 260; 301 figures. Paper covers, 2s. 6d. net; leather, 5s. net.)

[10] *Serbo-Croatian Self-taught, by the Natural Method.* By J. J. R. O'Beirne. Marlborough Self-taught Series. London: E. Marlborough and Co. 1921. (Cr. 8vo, pp. 111. Wrapper, 3s. net; cloth, 4s. net.)

APPLIANCES AND PREPARATIONS.

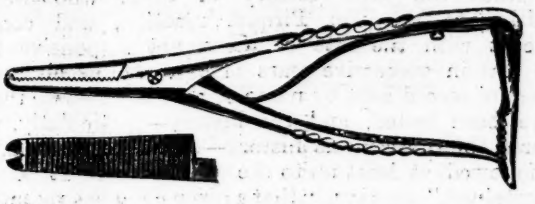
Two Instruments for Genito-urinary Surgery.

MR. JAMES MACMUNN (London) writes: The upper figure in the diagram below represents the combined massage and douching instrument for the prostate recommended by me in the correspondence columns of the BRITISH MEDICAL JOURNAL of January 22nd, 1921, page 142. The large massaging bulb—as large as the anal canal will admit with comfort—presses the secretions from the prostatic ducts, and at the same time aids the circulation of the haemorrhoidal plexus and the prostate, and higher up, the circulation of the vesico-prostatic plexus, which the finger cannot do. With this massage there is combined a strong stream of hot saline water, followed if desired by cold, upon the surface of the prostate. Thus, we have a means of alleviating congestion, resolving the inflamed tissue, and increasing muscular tone. The second figure represents a useful addition to prostatic massage, which must be used only by the surgeon. It is a long flat sound, as broad as the urethra will admit (I use three sizes), ending in a large bulb. The prostate is massaged against the convexity of the instrument. Hitherto Kollman's dilators were supposed to afford the best means of opening and emptying the ducts of the urethra, which is the chief consideration in the treatment of gleet, but, while this dilator can open follicles, it certainly cannot empty them, nor can suction. In my opinion, the only way to empty follicles is to massage them over flat sounds, preferably by means of a rubber roller. The instruments are made for me by the Holborn Instrument Company.

An Appendix Clamp.

Mr. W. K. IRWIN, F.R.C.S.Ed. (London, W.), writes: In appendicectomy the usual routine is to apply two pairs of forceps and divide the appendix between them. By this procedure appendix contents are forced into the part between the

two pairs of forceps, and to prevent the spread of infection the surgeon is compelled to resort to the inevitable "drop of pure carbolic." To avoid this trouble I have devised the instrument depicted, which is as easy to apply as any pair of forceps. The clamping part of the instrument is wide enough (9 mm.) to allow the base of the appendix to be ligatured and divided in the part crushed, the peritoneal surfaces of which are brought



into apposition so that the appendix contents are forced away from the region of ligature and division. The crushing surfaces of the clamp bear transverse serrations, which fix the appendix transversely. To avoid any risk of injuring the peritoneum the serrations, while strong enough to effect their purpose, are very fine, and have their ends carefully rounded off. In my opinion clamps with smooth unserrated surfaces which act equally in all directions, unless they are narrow like Mr. Donald Armour's ingenious instrument, tend to produce a longitudinal rupture of the appendix. The ratchet catch and spring are similar to those used in various forms of needle holders, and are locked and unlocked with the greatest ease. The clamp has been made in accordance with my suggestions by Messrs. Arnold and Sons.

Catheter Holder for Intrauterine Treatment of Gonorrhoea.

Dr. REMINGTON HOBBS, Medical Superintendent, Kensington Infirmary, writes: Since my article on the treatment of gonorrhoea in women appeared in the *Practitioner* last January I have had many more cases under treatment. In order to facilitate the introduction of the catheter into the fundus uteri I have devised a catheter holder, as illustrated. It is a light,

handy instrument for introducing a small terminal-eyed catheter into the uterus. It has the advantage that, owing to its size and to the bend in the shank, the line of vision of the catheter is not obscured. When the catheter has been inserted the lumen of the tube is not obliterated, so that the fluid can be syringed through whilst the tube is retained *in situ* by the holder. The instrument has been made for me by J. H. Montague, 69, New Bond Street, W.1.

INTERNATIONAL RED CROSS CONFERENCE.

THE tenth International Red Cross Conference at Geneva was closed on April 7th; it accomplished a great deal of work, but the practical results will only be seen after the various national societies have had time to consider and act upon the recommendations made.

The conference unanimously adopted resolutions inviting national governments to make additions to the Hague Convention absolutely forbidding the use of poison gases, whether as drift gases or in projectiles, and limiting war in the air to strictly military objects, so that the civil population may be as far as possible protected from this new weapon, and useless destruction avoided. A resolution, proposed by Mr. Frank Hastings, asking the governments to take steps to add to the International Convention rules governing the protection of aeroplane ambulances and air ships used for the carriage of sick or wounded, was adopted.

A recommendation, asking that a clause should be added to the Hague Convention forbidding the bombardment of undefended places, led to a good deal of discussion; it was finally adopted, as was also the suggestion from the Swedish and Danish Red Cross Societies that the rules should permit supplies to pass through a blockade to sick persons, old people, and children, although the difficulties in the way of carrying out this recommendation were recognized.

Among the resolutions adopted with regard to Red Cross work in peace was one to the effect that Red Cross societies should organize help for persons crippled in civil life, and that such help should include the establishment of special hospitals providing prosthetic apparatus and instruction in suitable trades. A resolution proposed by Sir John Lynn-Thomas, who had read a paper on the subject describing what had been done at the Prince of Wales's Hospital, Cardiff, for Wales, was approved by the appropriate committee and adopted at a meeting of the full conference. It set out that Red Cross societies should deal with the pressing problem of civilians who have lost a limb, in order to extend to them the benefits of the organized treatment which was for the first time established during the war to meet the needs of crippled soldiers and sailors.

A committee was appointed to consider the part the Red Cross should take in civil war; it recommended that the Red Cross Society of the country in which civil war prevailed should not be authorized to ask directly for help from the Red Cross societies of other countries, but only through the International Red Cross Committee. Discussion arose on several occasions during the course of the conference with regard to the present position in Russia. The International Red Cross Committee had been prepared to recognize the Russian Soviet Red Cross Society, but the president of that society made difficulties in attending and did not attend. Representatives of the old Russian Red Cross were present. Eventually resolutions were adopted by the conference calling the attention of the people of all countries to the fact that a state of civil war does not justify the violation of ordinary human rights, and protesting against the system of taking political hostages from among the families of accused persons, as also against the cruelties inflicted upon prisoners and upon persons interned during the civil war in Russia. The committee appointed to deal with matters affecting prisoners of war found the number and complexity of the questions raised too great for its resources; and M. Dinichert, representative of the Swiss Government, informed the conference that he had reason to hope that the Swiss Federal Government would take steps to bring about a diplomatic conference on the subject.

Before separating, the conference expressed the hope that the International Red Cross Committee would receive sufficient pecuniary support from the various countries, and that in future international congresses would be held at shorter intervals.

The Red Cross societies of the following countries were represented at the conference: *America, Argentina, Australia, Austria, Brazil, *Bulgaria, Canada, *Chili, *China, *Denmark, Esthonia, *Great Britain, *Greece, Germany, *Hungary, Holland, India (British), India (Netherlands), *Italy, *Japan, Latvia, *Luxembourg, *Mexico, New Zealand, Norway, Poland, *Portugal, *Rumania, *Serbia, *Siam, *Sweden, South Africa, *Spain, Sweden, *Switzerland, *Czecho-Slovakia, *Venezuela, *Turkey. An asterisk indicates that the Government of the country was also represented. In addition the following Governments were represented: Columbia, Ecuador, Haiti, Peru, Persia, Uruguay. The Papal Nuncio was present in a consultative capacity, as were also representatives of the Red Cross Societies of Rumania, Lithuania, and Ukraine, the International Labour Bureau, the American Relief Administration, and the Save the Children Fund.

As already stated, an agreement defining their respective spheres of work has been reached between the International Red Cross Committee and the League of Red Cross Societies. The latter was represented at the conference by the Director-General (Sir David Henderson), the Medical Director-General (Professor C. E. A. Winslow), and other officers.

A BRITISH home for necessitous Austrian children is being established on the estate of Klessheim, granted at what is described as a nominal rent by the provincial government of Salzburg. The home contains thirty children, but could accommodate five hundred were equipment and funds available. There is a British director, with a staff of trained nurses and other helpers. The parents are asked to contribute to the cost, and the American relief administration gives one meal a day. In this connexion it may be noticed that the American Relief Fund has sent Professor Pirquet 10,000 dollars to purchase food for the families of the lecturers in medicine at Vienna. The sum has been divided among two hundred families, who have consented to adopt Professor Pirquet's dietetic method described in our columns of October 30th, 1920.

British Medical Journal.

SATURDAY, APRIL 16TH, 1921.

THE EPIDEMIOLOGY OF TUBERCULOSIS.

As we have frequently pointed out, opinion respecting the epidemiology of tuberculous diseases has changed enormously within the last decade; no better illustration could be afforded than by the recently published work of Colonel Bushnell, a distinguished officer in the United States Army Medical Corps.[1] Though he modestly disclaims any authority conferred by the prosecution of original research, his essay is not the less valuable as a clearly written and even weighty contribution to the literature.

His main argument will not be novel to readers of Professor Calmette's papers and was restated with additional evidence by Colonel Lyle Cummins a few months ago. But Colonel Bushnell has covered a wider literary field, and his familiarity with American military and other official reports enables him to furnish information which is not available to most English readers. Expressed in a few sentences, his argument runs as follows: There is a fundamental distinction between the epidemiological behaviour of tuberculosis in races recently exposed to infection and amongst populations wherein the disease has prevailed for generations. Amongst the former alone do epidemics comparable to those of zymotics occur, and amongst them variations of climatic or hygienic conditions are factors of but minor importance. On the other hand, amongst acclimatized races the mortality of tuberculosis varies with the hygienic conditions and therefore, to a large extent, with social status. Not to speak of examples, such as that of the Kalmucks, which have frequently been quoted before, the contrast between the experience of the American negro and the American Indian is a striking illustration of the author's argument.

Colonel Bushnell is led to conclude that any attempt to eliminate sources of infection in settled countries would, if successful, be positively injurious. "Supposing," he writes, "that with extraordinary energy and sagacity we banish all tuberculosis from our town and rear an absolutely uninfected group of children. Having passed a childhood under the irksome restrictions that would be necessary, the time must come when they shall be permitted to enter the outside world, for the fear of disease cannot remain the paramount consideration during life. As soon as, now adults or adolescents, they leave the sheltering confines of their native town they will be exposed to the dangers of primary tuberculous infection, and that at an age when the world beckons most invitingly, and when prudence is least developed! In fact, they would be in a hardly less dangerous situation than the tropical native when he first enters a civilized community. Prophylaxis has simply resulted in exchanging the danger of a chronic and usually relatively benign infection for the danger of an acutely fatal infection." Colonel Bushnell thinks, in fact, that we should strive to substitute "an artificial premeditated infection for the present infection by chance," but he perceives that we have not as yet nearly sufficient knowledge to justify any such proceeding. We need, he thinks, to study the later history of those who were positive to the von Pirquet reaction, and compare it with the fate of those not responsive to the test in successive years of age. He would have a careful record kept by name of all the children that have been tested, and the history—particularly, of course, the tuberculosis history—of each child should be followed at least up to the 30th year. "It being ascertained," he says, "that a given child has recently become infected, proper steps can be taken to ensure the best possible care for it, to the end that the infection may remain latent. There can be no doubt that the first half-year after infection is a critical time for the child. Proper attention at this time would do more to lower the morbidity and mortality from tuberculosis than anything except preventing the infant from coming into contact with the consumptive. The work would be of great value if limited to the acquisition of data to be utilized only for the prophylactic care of recently infected children. We should, however, aspire to more. What an enormous mass of valuable data is lost because acquired a little at a time by many individuals, and never collated!"

Colonel Bushnell's opinions respecting the dangers incurred and the precautions to be taken when uncivilized races are brought into contact with the civilized, especially his strictures upon the impolicy of introducing consumptives from an old country into the midst of a virgin race, will command universal assent, but his observations upon the present and future of antituberculosis measures in an industrial population will not be so generally approved. It will, for instance, be argued that the danger of massive infections in adult life has not been sufficiently considered. In England and Wales (1910–12) the standardized mortality from tuberculosis of shoemakers was 456 per cent. of that of clergy; printers and bookbinders were nearly as bad; bricklayers had only 273 per cent. and coal-miners only 163 per cent. of the best attainable rate. It is not possible to argue that the domestic standard of life amongst bricklayers and coal-miners is far superior to that of printers and shoemakers, or that in childhood prophylaxis has been more efficiently carried out by "nature" for the children who are to become bricklayers than for those who will develop into printers. Hence we must suppose that either (*a*) physical occupational selection, (*b*) the hygienic conditions of labour, in Dr. Leonard Hill's sense, or (*c*) opportunities for massive infection, or all three factors combined, are enormously important factors of etiology.

The ultimate solution of the tuberculosis problem is not likely to be found in an expedient theoretically so simple as the deliberate immunization of the whole race during childhood.

Colonel Bushnell considers that one of the most dangerous doctrines relating to prophylaxis is that good health prevents tuberculous infection. He admits that good health will prevent tuberculous infection from becoming tuberculous disease, but denies that good health has anything to do with the reception of the tubercle bacillus into the body. This is, we think, literally true, and an important warning when the contact of virgin races with the civilized is in question. But it must not be misinterpreted into a suggestion that within a civilized community any measures whatever can be of higher importance than those destined to secure a high standard of physical and mental efficiency in the popular sense.

[1] *A Study in the Epidemiology of Tuberculosis, with Especial Reference to the Tuberculosis of the Tropics and of the Negro Race.* By George E. Bushnell, Ph.D., M.D. London: Bale, Sons and Danielsson, Ltd. 1920. (Pp. 221. 20s. net.)

As we said at the outset, Colonel Bushnell's work expounds a philosophy of tuberculosis very different from that which flourished but a few years since; it is, we think, a truer philosophy, but there is still need of a wider basis and a risk lest the new doctrine should tend to a particularism, a narrowness, which was the fate of its predecessor.

THE PHYSIOLOGY OF PAIN.

UNTIL comparatively recent times the problem of pain has been a subject of philosophic speculation rather than of physiological study. The philosopher has usually approached the question under the conviction that pain must necessarily and, however indirectly, have value and meaning for mankind. A recent review [1] observes that philosophical methods and conclusions are unsatisfying to the biologist, who is met at the outset by the fact that there is an enormous discrepancy between the amount of experienced pain in the world and any observed physical, mental, or moral benefit that ensues to the sufferers. It has often been assumed that, within limits, sensitiveness and liability to pain constitute conditions tending to favour survival. These assumptions cannot be unreservedly accepted. It is not correct, for instance, to regard pain as invariably related, as to its origin and continuance, with some definite underlying abnormality of which it is a more or less precise expression and measure.

Certain peculiarities in the status of pain are not difficult to detect, and they may be indicated in three broadly defined groups. The first of these peculiarities is the frequency of pain. It is the commonest disturbance of well-being to which man is subject. Even the healthiest of us will find that, quite apart from injury, scarcely a day passes without some transient twinge or stab or ache that easily lapses from a healthy memory because it is unaccompanied by any other evidence of abnormality.

The second is the relation of pain to its bodily cause. Pain is of all symptoms the one most likely to be persistent and inveterate. The longer it persists the more difficult it is to relieve, though the originating lesion has ceased to exist. It seems almost as if when pain has been present for a long time it became as it were ingrained in the very substance of the nervous system, and rendered truly ineradicable.

The third peculiarity concerns its functional value. Within the comparatively narrow limits of recoverable injury pain furnishes the patient with guidance whereby life or activity may be preserved. We see proof of this in the damage that may ensue when the sensibility to pain is lost, in such diseases as tabes and syringomyelia. But it soon becomes obvious that a sharp distinction must be drawn between pain in relation to disease and pain in relation to injury. In the majority of diseases it is no more than an arbitrary and superadded affliction. Certain diseases consist, as it were, entirely of pain; in trigeminal neuralgia and the pain that sometimes follows amputation the one symptom constitutes the whole disease. Such cases exemplify the very acme of the functional uselessness of pain. A superficial examination of the symptom as met with in practical medicine furnishes a fair body of evidence that it occupies a remarkable, an even unique position.

The study of pain in the normally innervated skin has yielded certain definite and well established facts which justify the general statements that the peripheral pain mechanism is excitable by a number of different stimuli which have no single physical character in common. While the stimulus required is relatively intense, the consequent reaction is relatively excessive. The most remarkable feature, however, is anatomical; the peripheral pain end-organ differs from all other end-organs in being a mere free and naked terminal arborization. A specialized end-organ is to be regarded as at the same time increasing accessibility to one specific stimulus and diminishing it to all others. Of the other specific sensory spots in the skin each is accessible to one stimulus alone. The touch spot responds to movement, the heat spot to transference of heat to the skin, the cold spot to transference of heat from the skin. But the pain spot is accessible to stimulation by all of these, with the reservation that the mechanical stimulus that would excite a touch or thermal spot has to be increased in intensity in order to stimulate a pain spot. That is to say, the threshold of the pain spots is relatively high, and when the threshold is reached the sensation "pain" seems suddenly to burst upon the sensorium with a veritable explosion of reactive energy. This explosive quality of the sensation of pain constitutes one of the chief features distinguishing it from other sensations, which in the main possess mere "recognition" qualities.

After simple division of a nerve, as in amputation, an outgrowth of axis-cylinders occurs from the central end into the surrounding tissues. The nervous elements seem to seek to invade, the connective tissue elements to restrict the invasion, and each seems to be excited to activity by the other. The invading axis-cylinders fail to obtain the requisite insulation which appears essential to all peripheral nerves, they fail to find a termination in appropriate end-organs, and remain to all intents free and naked arborizations of neural tissue in somatic tissue, and come to resemble in that respect "pain" end-organs. Thus they become exposed to constant subliminal excitation, and this fact perhaps explains that intensification of sensibility met with in recovering areas which makes all forms of stimuli result in sensations akin to pain. All other end-organs than those of pain have their terminal fibrils shut in by a well-marked encapsulating formation. This completeness of insulation may be a means of damping down the general excitability of such nerves so that the sensations they originate shall be without urgency and explosiveness, and permit of that quiet sensory atmosphere in which alone deliberation and discrimination are possible.

The review concludes with an attempt to trace out the way in which the evolution of common sensation has proceeded. The germ of a nervous system is a group of cells capable of irritating and being irritated by the other cells of the body. The essential hostility of neural and non-neural tissues gives us, perhaps, a hint of the physiological significance of the ectodermal origin of the nervous system, and of its being formed at the surface and then sunk *en masse* into the substance of the embryo. The opportunities for contact between the two tissues require limiting and regulating. As we ascend higher in the animal scale we find an extended series of increases in the centralization and insulation of the nervous system, centralization rendering the insulation easier, until we see in the human nervous system how very elaborate and complete the mechanisms securing this condition have become.

In animals with a diffuse nervous system response to stimulation seems to be for the most part immediate and urgent, so that what sensation there is in such animals is all of the quality which survives in

[1] *Medical Science, Abstracts and Reviews*, 1921, iv, 43.

man only as pain. Delay between stimulus and response is possible when improved insulation has damped down the urgency of incoming sensation; as soon as delay is possible deliberation and discrimination appear. Sensibility to pain, it is suggested, is the survival of the primordial mode of sensation. Its urgency and tendency to evoke immediate motor response is the reproduction of the normal experience of the lower invertebrates. From it the discriminative forms of sensibility have been differentiated by the progressive increase of insulation. Regeneration of a nerve by exposing a greatly increased number of nerve fibres to somatic contact and irritation throws back all forms of sensibility more or less into the primitive type and provides an explanation of the characteristically variable phenomena of recovery after suture. If we view pain as an exaggerated response by a physiologically irritated nerve, it is possible to get some conception why pain is the commonest of symptoms, and why it is apt to become inveterate. Pain is, as it were, physiologically just not present in us all, and what appears to be a very slight disturbance pathologically may prove an effective and incurable excitant of it.

THE EVEREST EXPEDITION.

FOR the past few months preparations have been in active progress for the expedition, organized jointly by the Royal Geographical Society and the Alpine Club, to explore Mount Everest, the highest peak in the world. The preliminary survey and the subsequent ascent have been made possible by the permission of the Tibetan Government for the expedition to enter Tibet. Hitherto no mountaineer has reached within about sixty miles of Mount Everest, and the northern approaches to this and the neighbouring Himalayan peaks have never been surveyed; the advance through Tibet will therefore break wholly new ground. Apart from the difficulties of travel in remote and unexplored mountainous districts, the two chief problems appear to be the maintenance of supplies and the preservation of health and vigour at great altitudes. Recent work in physiology suggests that the key to success is an adequate supply of oxygen and of foods rich in vitamins, but the transport of oxygen in bulk over mountainous passes would be a formidable undertaking. It is estimated that on the summit of Mount Everest the rarefied air contains only one-third of the usual amount of oxygen. As the President of the Alpine Club, Professor J. N. Collie, F.R.S., has pointed out, in those accustomed to high altitudes this suffices to support life, but the human engine obviously cannot do much work with so limited a supply of oxygen. The body, however, makes efforts to adapt itself to high altitudes, chiefly by a rapid increase in the number of red blood corpuscles. People living on the Pamirs—the extensive plateau known as "The Roof of the World," from which diverge the principal mountain chains of Asia—have an average count of over 8 million red cells per cubic millimetre. Trained mountaineers have proved their ability to live and at the same time do a certain amount of work at an altitude of nearly 25,000 feet, and Professor Collie believes that the extra 4,000 feet necessary to climb Everest should not prove entirely prohibitive. The main objects of the survey party will be to reconnoitre the northern slopes of Mount Everest, with a view to finding a possible way up the peak itself, and to establish an advanced base for the party that later essays the final ascent. The leader of the present expedition is Lieut.-Colonel Howard Bury. The mountaineering party consists of Mr. H. Raeburn, with Messrs. G. Mallory and Bullock, members of the Alpine Club. The medical officer and naturalist is Dr. A. F. R. Wollaston; the chemist is Dr. A. M. Kellas, lecturer on chemistry in the Middlesex Hospital Medical School; and two members of the Indian Survey—Major Morshead and Captain Wheeler—are attached to the expedition. The survey party propose to leave Darjeeling on May 14th, travelling towards Tibet through the Chumbi Valley.

EPIDEMIC HICCOUGH AND ENCEPHALITIS LETHARGICA.

A CONTRIBUTION of considerable value in regard to the association of epidemic hiccough with encephalitis lethargica was made by Dr. William Boyd, professor of pathology in the university of Manitoba, Winnipeg, in two papers published last year.[1] Encephalitis lethargica reached Winnipeg in the last week of October, 1919, and gave rise to a somewhat extensive epidemic. Of the 75 cases with which Dr. Boyd had personal acquaintance 29 died, and complete necropsies were made by him in 19 cases; in two other fatal cases, in which a complete examination could not be made, the kidney was removed for pathological examination. Professor Boyd gives a careful and well illustrated summary of the history, symptomatology, and pathology of the disease, and comes to the conclusion that the relation of encephalitis to influenza is more apparent than real, as twelve months separated the outbreak of the former from the latter, and most of the patients who suffered from encephalitis had never had influenza; similarly, his opinion is that the condition is quite distinct from poliomyelitis. There was a most remarkable epidemic of persistent hiccough in Winnipeg and the neighbouring towns in the early part of November, 1919—at a time, Dr. Boyd states, when it had not been reported from any other cities, and a few days after the first cases of encephalitis had appeared in the city. A very large number of cases occurred. The patients included several doctors, one of whom kept hiccoughing continuously at intervals of about a minute for five days; the usual duration of an attack was from twenty-four to forty-eight hours. The condition yielded readily to a single injection of morphine. If the two epidemics bore no relation to each other, Dr. Boyd suggests that the coincidence is at any rate remarkable. The myoclonic contractions of the abdominal muscles observed in lethargic encephalitis and the contraction of the diaphragm in hiccough were very much alike. Could it be, he asks, that the virus of the disease might spare the brain in mild cases but irritate the cervical origin of the phrenic nerve?

RESEARCH DEFENCE.

THE Research Defence Society has done a great amount of useful work during the thirteen years of its existence. It is something of a reproach to the intelligence of the nation that it should have to exist at all, but unhappily the opponents of experimental medicine—and in that we would include physiology as well as pathology—are among the most active of those who seek to obstruct the advance of science. It is a national society of men and women united to promote national health and efficiency, to bring about a better understanding of the value of medical and surgical studies, and to expose the false statements made against them. Before the war it had about 5,000 members and associates; it has not so many now, and this is a pity, for all of us enjoy the benefits which result from the studies the Society exists to defend. It was founded in 1908. Among those present at the foundation meeting was the late Lord Moulton, though, as one of His Majesty's judges, he did not think it proper to become a member. In the last number (April) of a little quarterly journal the Society issues, we are reminded of the very valuable evidence Lord Moulton gave before the Royal Commission in July, 1907. In the course of his evidence, copies of which the Society can, we understand, still supply, Lord Moulton said: "The advance of science

[1] *The Canadian Medical Association Journal* (February, 1920) and *Annals of Medicine* (Vol. 1, No. 2, July, 1920).

takes the workers in science more and more beyond the ken of the ordinary public, and their work grows to be a little understood, and much misunderstood; and I have felt that the need would come for interpreters between those who are carrying on scientific research and the public in order to explain and justify their work." It is for this reason that the Society's motto is *Interpres Interpretum*. Men and women of science are interpreters of Nature, and therefore the society which popularizes their work is an interpreter of interpreters. The Society will arrange addresses and lantern lectures and is prepared to supply literature to applicants, but it wants more members. The subscription, which is only 6s. a year, to include the Society's publication, may be sent to the Secretary at 11, Chandos Street, London, W.1. The president of the Society is Lord Lamington, the chairman Viscount Knutsford, the vice-chairman Mr. Stephen Paget, F.R.C.S., long its honorary secretary; its present honorary secretary is Lady Horsley, its parliamentary honorary secretary Captain Walter E. Elliot, M.P., and its honorary treasurer Sir David Ferrier, F.R.S. The last copy of the Society's quarterly, *The Fight Against Disease*,[1] contains a series of notes on various subjects, including the recent work of Calmette on tuberculosis, described in the BRITISH MEDICAL JOURNAL of December 11th, 1920. The very smallness of the subscription stands in the Society's way; it seems too much trouble to get a postal order for 6s., but we hope many of our readers will take that trouble nevertheless.

THE DISCOVERER OF BRIGHT'S DISEASE.

THE first volume of the new series of the *Guy's Hospital Reports*, edited by Dr. A. F. Hurst, with assistance in the various special departments, has somewhat altered its outward aspect, and is now to appear quarterly; but its contents are as attractive as ever, and among them the first is appropriately that on "Richard Bright and the discovery of the disease bearing his name," by Sir William Hale-White,[2] who dutifully speaks of his hero as certainly among the first five or six geniuses in our profession. Historical memoirs and obituaries rightly form part of the subject matter of hospital reports, and in the past the *Guy's Reports* have been noticeable in this respect; it is therefore satisfactory to learn that Sir William Hale-White will supplement his present interesting article by one on "Bright's contributions to medicine apart from kidney disease," and that Dr. John Fawcett will write on "Addison and Addison's anaemia." The life-history and pathological activities of Thomas Hodgkin should also find a similar biographer, for he did much, and yet is chiefly remembered on account of the late Sir Samuel Wilks's self-denying loyalty in calling what is now more commonly known as lymphadenoma, Hodgkin's disease. In addition to a marvellous ability for making accurate observations, Bright had the much rarer gift of correlating and synthetizing data; he was a pioneer in cerebral localization, and one of the earliest describers in this country of acute yellow atrophy of the liver, of malarial pigmentation of the brain, of pulmonary collapse in whooping-cough, and the mitral murmur in chorea. But the causal relation of kidney disease to albuminuria and dropsy will always stand out along with Laënnec's work on thoracic disease (on which Sir William Hale-White is also to contribute a memoir) as the outstanding discoveries in medicine in the early part of last century; Bright's conclusions were solidly based on extensive observations at Guy's Hospital, and were published in 1827, 1833, and 1836, the last paper being entitled "A tabular view of the morbid appearances in one hundred cases of albuminous urine." Sir William Hale-White describes this series of papers as one of the most wonderful in medical literature, and points out that except for retinal changes and blood pressure estimations every ordinary clinical manifestation is mentioned; Bright did indeed refer to the occasional occurrence of impaired vision and a hard pulse. So careful and complete were his observations that comparatively little has been added since he proved that the renal change is the primary factor. It is, of course, true that the association of albuminuria with general dropsy had been previously established in 1806 by William Charles Wells, the author of the famous "Essay on Dew," who, while giving the credit for the detection of albuminuria to Cruickshank in 1798, believed that all the abdominal organs, including the kidneys, were inflamed. Dr. John Blackall of Exeter, in his "Observations on the Nature and Cure of Dropsies," elaborated Wells's observations on albuminuria, and appears to have suspected that the kidneys were affected; but though these physicians may have prepared the way for Bright's great discovery they in no way anticipated it.

LIGATIONS OF THE LEFT SUBCLAVIAN ARTERY.

THE twenty-first volume of the *Johns Hopkins Hospital Reports* (fasciculus 1) is entirely devoted to an exhaustive and interesting analysis by Professor Halsted of ligatures of the first portion of the left subclavian artery. The total number of cases in which this difficult operation has been performed are few, only 21 in all being recorded in the literature. This is partly due to the fact that the older surgeons forswore the operation, declaring that it was "bad in principle" and "most unfortunate in practice." The first part of the subclavian is, on the left side, very deeply placed, and in the presence of an aneurysmal sac of any size the field of operation is so cramped that the surgeon needs an eagle's eye, a lion's heart, and a lady's hand, as Thomas Fuller said, to carry the undertaking to a successful conclusion. Professor Halsted's monograph opens with a delightful and characteristic quotation from Osler tracing the history of the surgery of aneurysm, and proceeds to the description of successful ligature for a huge subclavian aneurysm. How large this was, and how formidable was the task of tying the vessel, may be readily appreciated from some excellent photographs of the patient. Halsted resected the left sterno-clavicular joint and the left two-thirds of the manubrium. Later he had to sacrifice the first costal cartilage and the adjacent part of the sternum. The arch of the aorta and its descending part were then clearly seen and the left auricle of the heart could be palpated with the finger. At length the left subclavian artery was identified lying close to the vertebral column. Two pieces of linen tape were threaded round the vessel and tied with force sufficient to close completely the lumen without crushing the vessel wall. Recovery was uneventful, and the aneurysmal sac shrank greatly. Two years later it was seen to be again increasing in size. Professor Halsted then excised the whole sac after resecting the middle of the clavicle. The success of this case is a just and fitting tribute to the distinguished operator, for he it was who, in 1892, performed the first successful ligature of the first part of the left subclavian. The paper is in many ways full of interest and of scholarship. It contains an instructive discussion of the value of simultaneous ligature of the vein when dealing with the vessels at the root of a limb and in the popliteal space. Professor Halsted pays homage to Sir George Makins on this question, and gives a full translation of the classic case of Von Oppel and Korotkov, which illuminates the subject in an inimitable manner. It would appear that the only British surgeons who have tied the first part of the left subclavian artery are Stonham, Sir William Banks, C. G. Browne, Newbolt, Sinclair White, and Sir Charles Ballance. It must be admitted that this is a very

[1] Macmillan. Price 6d.

[2] *Guy's Hospital Reports, 1921*, vol. lxxi (vol. i, fourth series), No. 1, pp. 1-20. Issued quarterly. London: Henry Frowde, Oxford University Press. Subscription, 2 guineas, post free for volume of four numbers; single number, 12s. 6d.

fair proportion for one country out of 21 recorded cases, but it is possible that others may have performed the operation without recording the fact in print.

THE OPTOPHONE.

DR. ARCHIBALD BARR, Emeritus Professor of Engineering in the University of Glasgow, on April 6th demonstrated before the Royal Society of Arts the improved optophone, the instrument invented by Dr. Fournier d'Albe for enabling the blind to read ordinary print. This instrument was first shown in this country by the inventor in 1912, before the Optical Convention, but at that time the stage of its development was such that a blind person could by its use only distinguish bright lights. A year later, when it was exhibited to the British Association in Birmingham, it had been improved so that printed letters could be recognized. The war retarded further development, but since the war Dr. Barr, having the resources of the engineering firm of Messrs. Barr and Son behind him, has, with the co-operation of Dr. Fournier d'Albe, so perfected the mechanism of the invention that with its aid ordinary letter-press can be read by a blind person after comparatively little practice. The instrument depends for its action on the fact that the conductivity of electricity by metallic selenium is increased by light. Above an electric filament lamp revolves a disc with five rings of perforations around its circumference. The light flashing through the perforations in the disc is led by a series of lenses to two selenium detectors which are interposed in a circuit with a battery and a telephone, and the flashes of light are transformed by the selenium detectors into sounds in the telephone. When the amount of light is modified by the interposition of any object, the sound in the telephone is modified accordingly, and this happens when the figure of a black letter of the alphabet, moved across a slot, is reflected into the line of the light from the lamp. The notes which are given out differ with each letter, so that letters, and eventually words, can be recognized by their distinctive notes. Even the audience at Dr. Barr's demonstration was able, under his tuition, to recognize certain large capital letters in a few moments. A blind lady who had had, it was stated, only some thirty hours' practice, was able before the audience to take up a book, place it in position on the instrument, and after a little difficulty in finding where the print commenced, read out several lines quickly without any mistake. Such languages as Hebrew, Arabic, and Chinese, with their distinctive calligraphy, would be even easier to read in this way than Roman letters, and Dr. Fournier d'Albe, who was present at the demonstration, claimed that with its aid the literature of the whole world is opened to the blind.

HOSPITAL ALMONERS.

THE report of the Hospital Almoners' Council for 1920 shows the increasing value of the work undertaken by this organization. It is important that almoners should be carefully trained and should have special qualifications for the post, and it is to these matters that the Council mainly devotes its attention. The view is now generally held that an almoner's duty does not merely consist in checking abuse of the out-patient department of hospitals. This officer, who is usually a woman, should acquire a knowledge of the patient's home conditions for the use of the hospital staff, and should co-operate with other charitable agencies in order to aid in carrying out the prescribed treatment in the most thorough manner. She should have a complete knowledge of the municipal and State activities which may have an influence upon the health and social conditions of the patient, and should organize the "after-care" of patients on discharge from hospital. If an almoner is to carry out such important work properly a thorough training, both general and technical, is necessary, and this training the Council is providing. It extends over two years; part of this time is spent in general instruction in economic social theory at the University of London and in practical work with the Charity Organization Society. The remainder of the period is spent under the direction of an almoner at a hospital training centre in gaining a knowledge of an almoner's duties not only in the hospital, but in health visiting, infant welfare centres, rescue homes, and tuberculosis clinics. Certificates are granted by the Council to almoners who have gone through the recognized training; the offices of the Council are at Denison House, 296, Vauxhall Bridge Road, S.W.

CALCUTTA SCHOOL OF TROPICAL MEDICINE.

AN appeal to the Government of Bengal for an annual grant has been made by the Calcutta School of Tropical Medicine and Hygiene and the Carmichael Hospital for Asiatic Diseases. The financial statement issued with the note shows that down to the end of February Rs.20,77,904 had been subscribed, and that out of this the buildings and equipment had been provided, and an endowment fund of Rs.3,55,000 created. The estimate of recurring annual expenditure amounts to Rs.5,20,228, leaving a balance of Rs.3,92,000, which the Government of Bengal is now asked to provide. The appeal points out that the scheme has two sides, research and teaching—both essential for fighting disease—and that it is the teaching side the Government of Bengal is especially invited to support. The buildings, erected and equipped with the funds raised by Sir Leonard Rogers, provide not only for research work, which is already in part endowed, but also for post-graduate teaching of tropical medicine and hygiene.

PHOTOGRAPHS OF CRETINS.

WHEN the British Medical Association met at Carlisle in 1896, Dr. W. Rushton Parker of Kendal exhibited photographs of over fifty cases of sporadic cretinism which he had succeeded in collecting from many sources. This collection of photographs—one of the largest yet made—has been presented by Dr. Parker to the Royal College of Surgeons of England, where it may be seen and studied by all interested in cretinism.

THE Earl of Onslow, formerly Parliamentary Secretary to the Ministry of Agriculture, has been appointed Parliamentary Secretary to the Ministry of Health, in succession to Viscount Astor, whose resignation on the ground of ill health was announced a month or two ago. Sir Alfred Mond, Minister of Health, has appointed Sir H. Kingsley Wood, M.P., to be his parliamentary private secretary.

WE regret to announce the death, on April 12th, of Dr. Henry Barnes, O.B.E., of Carlisle, who was President of the British Medical Association in 1896–97. We hope to publish a memoir in an early issue.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Public Health and Local Rating.

WITH the revival of the rights of private members to bring up subjects on a limited number of evenings, Colonel Bowles, on April 6th, moved for the appointment of a Select Committee to inquire into the incidence of local rating by public authorities. He argued that these bodies had grievances in the burdens put upon them. He quoted the recommendation of the Royal Commission of which Lord Balfour of Burleigh was chairman, in 1904, that asylums for pauper lunatics should be made a national service, and pointed out that since then expenses for National Insurance, for tuberculosis sanatoriums, provision for medical inspection of schools, asylum officers' superannuation, and the working of the Mental Deficiency Act and of the Venereal Diseases Act had severally, in part or wholly, been placed on local rates.

Sir Arthur Warren, seconding the motion, reminded the House that under the Tuberculosis Bill now before Parliament there was an estimate that additional services would cost £40,000, and of this half was to be provided from the rates.

Sir Alfred Mond, the new Minister of Health, in the course of his reply, recalled that the cost of the fresh work which had been imposed upon local authorities by health developments—in regard to tuberculosis, venereal disease, maternity and child welfare—did not amount to more than a 2½d. rate through the country. He did not wish to indicate that he felt that new services should be lightly thrust upon local authorities at the present time. On the contrary, he took this first opportunity of stating to the House that it was his firm intention to endeavour to avoid all unnecessary expenditure in the very difficult financial condition in which the country was placed. While, however, it was important not to incur unnecessary new expenditure, it was, he said, even more important to see that full value was got for old expenditure. The fact that money was being spent on a service was by no means necessarily evidence that the best result was being obtained. Large expenditure did not necessarily show great zeal; often better results could be got by careful administration. He intended to devote his attention strictly to this side of the work. In this connexion he referred to a request made to him to introduce fresh legislation for the superannuation of Government officials, which would have put an increased burden on the rates.

Major Prescott, interrupting, asked whether the Minister was not aware that the recommendations of the Departmental Committee would not involve any charge on the rates.

Sir Alfred Mond replied that he was informed that was not the case.

Major Prescott rejoined that the report recommended a contributory scheme, which would not involve any charge on the rates whatever.

Sir Alfred Mond said that any way a contributory scheme would mean a contribution from the State. As to the comparative burdens of rates, Sir Alfred asked the House to remember that since the Balfour of Burleigh report the rates had been relieved as regards police and education charges, and also as to road maintenance. To transform local authorities into mere agents for spending other taxpayers' money would throw upon them a great temptation to incur local popularity at the cost of other people. He had a case of that sort recently brought under his notice in connexion with the infant welfare centres. That temptation could only be guarded against if the responsibility for expenditure was brought directly home. Sir Alfred Mond concluded by asking the House to be satisfied that a strong Cabinet Committee had been appointed to go into the whole question of local administration with a view to some legislation next session.

Captain Elliot, taking up a sharp criticism by Mr. A. Hopkinson of the administration of the late Minister of Health, said it should be put on record that there had never before been such an improvement in the vital statistics of the country as there had been during the administration of Dr. Addison, who was entitled to the credit of that achievement.

The motion was defeated by only a single vote, despite the fact that the Government Whips told against it. The figures were: Ayes, 48; Noes, 49.

Dr. Addison.

None are better able to judge of the value of Dr. Addison's services during his period of office as Minister of Health than the medical members of Parliament. The following resolution was unanimously adopted at a meeting on April 11th:

> That the medical members of the House of Commons express a cordial appreciation of the services of the Right Hon. Christopher Addison, M.P., as Minister of Health, and congratulate him on the excellent work he has done in the face of many difficulties. They wish to place on record their admiration for his zeal and devotion to duty, and his untiring work in the interests of public health.

Civil Service Estimates.

The estimates for Civil Services for the year ending March 31st, 1922, have been issued in a series of White Papers.

Ministry of Pensions.—For the Ministry of Pensions the total estimate is £111,556,666, which represents a net decrease of £11,678,334. The cost of the medical services amounts to £11,153,000, made up as follows: Salaries, wages and allowances of medical staff, including fees to members of medical boards, medical referees, etc., £2,277,000—an increase of £451,000; travelling and incidental expenses of medical staffs, medical boards, etc., £51,000—an increase of £26,000; travelling and incidental expenses of disabled officers, nurses and men attending medical boards, etc., £890,000—an increase of £24,000; medical treatment of disabled officers, nurses and men who have left the service, £6,508,000—a decrease of £1,402,000; expenditure in connexion with the provision of artificial appliances for disabled officers, nurses and men, £900,000—an increase of £374,000. In the sum already mentioned for salaries, wages and allowance of medical staff appear among many others the following particulars: Director-General of Medical Services £1,800, Deputy Director-General £1,500, Principal Medical Officer, £1,300, Chief Commissioner of Medical Services £1,350. Sixteen principal medical officers (at £1,200), £20,000. Three hundred and nineteen medical officers (at salaries varying from £750 to £1,100), £287,900. Fees to medical board, medical referees, part-time medical officers, etc., £1,450,000, as compared with £1,230,000 for the previous year. All the salaries and fees named above are inclusive.

Ministry of Health.—For the Ministry of Health the estimates show a total of £24,345,098, being a net decrease of £3,342,709; the sum allotted to part-time medical referee consultants is £40,000—a decrease of £20,000; and the sum allotted for medical referee service, fees for nurses, etc., is £31,850—a decrease of £2,000. The miscellaneous grants include: Maternity and child welfare, £1,100,000—an increase of £323,000; treatment of tuberculosis, £1,210,000—an increase of £510,000; treatment of venereal disease, £420,000—an increase of £137,000; grants for the welfare of the blind, £100,000—a decrease of £9,000; grants to voluntary hospitals in respect of spirit duty, £3,500. In the total figures already given of £1,959,076 for salaries, wages, etc., for the Ministry of Health the amount for the medical staff is relatively small. The principal figures are: Chief medical officer, £2,000; six senior medical officers (at salaries ranging from £1,200 to £1,400), £7,899; fifty medical officers (at salaries varying from £600 to £1,100), £39,467; four divisional medical officers, £6,400; thirty regional medical officers (at salaries varying from £1,000 to £1,400), £37,024. Other figures include the remuneration of part-time medical referees and consultants, £40,000 as against £60,000 last year.

Scottish Board of Health.—The estimate for the Scottish Board of Health amounts to £3,375,999, being a net decrease of £573,290. Salaries, wages, and allowances are put at £240,390—an increase of £65,765; part-time medical referee consultants at £9,400, an increase of £5,000; the miscellaneous grants include maternity and child welfare, £180,000—an increase of £105,000; treatment of tuberculosis, £400,000—an increase of £194,000; treatment of venereal disease, £56,000—a decrease of £500; welfare of the blind, £20,000—an increase of £1,500; grants to voluntary hospitals in respect to duty on spirits, £650—a decrease of £100; Highlands and Islands (Medical Services) grant (grant in aid), £42,000. In the total figures already given for salaries for the Scottish Board of Health there are three entries for the cost of the medical department: Nine medical officers (at salaries from £500 to £800) £6,204; two medical referees (at salaries from £1,000 rising to £1,400 inclusive), and three medical referees (at salaries from £1,000 rising to £1,200), the five making a total cost of £5,400. The part-time medical referee consultants, etc., will cost £9,400, of which £3,250 will go in fees to local part-time referees and £4,000 in allowances for specialists.

National Insurance, Ireland.—The Civil Service estimate under this heading is for £618,785, or a net increase of £87,215 on the estimate for the previous year. Salaries include those of two medical officers at £700 a year, and one assistant medical officer at £350—these being unchanged. The main enlargement of expense is for grants in aid of sickness, disablement, and maternity benefit £230,600, and additional benefits £23,000; the two sums standing against £189,800, the amount of the estimate for the previous year.

Board of Education.—The total estimate for the medical department of the Board of Education is £17,441, as compared with £16,373 for the previous year. The present holder of the position of Chief Medical Officer, being also Principal Medical Officer of the Ministry of Health (in which capacity he receives a salary of £2,000 a year), has from the Board of Education only £100 a year. The total staff otherwise is nineteen, comprehending a chief mediol inspector, a medical staff officer, six medical officers, and eleven inspectors.

Grants to Universities and Colleges.—The estimates of grants to universities and colleges of the United Kingdom is for a total sum of £1,416,000, which, with additional grants of £84,000 to the Irish universities, will bring up the total to be paid for the maintenance of university institutions in the United Kingdom to a million and a half sterling. This is in accordance with a pledge given last October by the Chancellor of the Exchequer, and represents an increase of half a million. The figures for England embrace allowances in respect of clinical units at four hospital medical schools in London. The grant to the London Hospital Medical School will thus be £13,000, as against £6,000 in the previous year; that to St. Bartholomew's Hospital Medical School £12,000, as against £5,000; that to St. Thomas's Hospital Medical School £10,030, as against £4,500; and that to University College Hospital Medical School £10,500, as against £4,000. The Universities of Oxford and Cambridge are each to receive £30,000.

The Parliamentary Medical Committee.

At the meeting of the medical members of the House of Commons on April 11th the Public Health Officers (Security of Tenure) Bill was discussed, and the Committee decided to lend it their support. The Coroners Bill was considered, and it was decided that when this bill reached Committee a new clause should be moved to increase the fees paid for *post-mortem* examination and medical evidence. The Dogs Bill was discussed, and it was agreed unanimously to oppose it. The Tuberculosis Bill and the Health Estimates were also considered.

Termination of the War.—In reply to questions on April 4th by Mr. Lyle-Samuel, Lieutenant Commander Kenworthy, and Sir Frederick Banbury, the Prime Minister explained the position as to the statutory termination of the war. The Act of 1918 provides that the date shall be as nearly as possible the date of the deposit of ratifications of the last Treaty of Peace. Mr. Lloyd George reckons that there must be some settlement at an early date between Turkey and Greece and all the other Powers, but also acknowledges that the matter of ratification cannot be left open indefinitely. The Turkish delegates have promised on their return to place the terms offered before the Assembly and to reply to the Allies within five or six weeks. That leaves another three or four weeks before the Turkish position is known.

Local Government Officers' Superannuation.—Sir Alfred Mond (Minister of Health), replying to Mr. Arthur Henderson on April 5th, repeated what Dr. Addison said some time ago, that no legislation on the subject of the superannuation of local government officers can be introduced this session owing to the expense that would be involved.

Public Health (Officers) Bill.—The first reading was given on April 11th to a private member's bill, introduced by Sir Philip Magnus, supported by Sir Henry Craik, Lieut.-Colonel Raw, Sir James Remnant, and Mr. Myers, "to amend the law relating to tenure of office of medical officers of health, sanitary inspectors, and inspectors of nuisances."

County Councils and Tuberculosis Treatment.—In reply to Mr. T. Thomson, Sir Alfred Mond stated, on April 11th, that 143 of the 145 county and county borough councils in England and Wales have made arrangements for the institutional treatment of non-insured tuberculous persons, but in one case the provision so far made extends only to dispensary treatment. The schemes of twenty-seven county and borough councils for the appointment of committees for the after-care of insured and non-insured tuberculous persons in their areas have been approved by the Ministry of Health or its predecessors.

Definitions in Lunacy Acts.—Captain Bowyer asked, on April 6th, whether the Minister of Health would amend the wording of the Lunacy Acts in order to substitute the terms "patients" and "mental hospital" for "pauper lunatic" and "pauper lunatic asylum." Sir Alfred Mond replied that he had nothing to add to the answer given by his predecessor to a similar question.

Pensions Grant for Heart Disease.—Mr. Raper asked, on April 7th, if the sum of £46,000 had been saved in pensions and grants to discharged soldiers suffering from heart disease; and what was the nature of the medical discovery by means of which this saving was effected. Mr. Macpherson said he had no knowledge of the figure referred to. A sum of nearly £4,000,000 a year was at present being paid to men who were pensioned for heart disease. Every effort was being made by the establishment of cardiological clinics with improved methods of diagnosis and treatment to restore the health of men who suffered from this complaint.

Approved Societies and Hospitals.—Colonel Mildmay asked the Minister of Health, on April 6th, whether he was taking any action in accordance with the recommendations of the interim report of Lord Cave's Committee with reference to the disposal, in the interests of hospitals, of the surpluses of approved societies. Sir Alfred Mond replied that a copy of the report had been sent to every approved society with a covering letter, in which the society was urged to give its serious consideration to the question of using part of its disposable surplus (if any) in making payments towards the cost of its patients in hospitals. This was only one of many additional benefits which it was open to societies to provide.

Pensions' Medical Treatment for Tropical Diseases.—Mr. Macpherson, answering Mr. W. Graham on April 7th, said that the Ministry of Pensions made no provision for the medical treatment of men disabled in former wars, and only in exceptional cases would a man need treatment now for a disability incurred so long ago; the question had, however, recently been raised in connexion with certain tropical diseases and was now under consideration.

The Naval Hospital at Yokohama.—In reply to Commander Bellairs, who asked whether the Admiralty could take steps to abolish the Royal Naval Hospital at Yokohama, Mr. Amery said, on April 6th, that the institution was required to receive convalescent cases from Hong Kong during the period of hot and damp weather experienced there. Its abolition would result in a larger number of cases being invalided home from the China station, with consequent inconvenience and expense. Commander Bellairs asked whether the Minister was aware that, although the hospital had some 80 or 90 beds, not a single patient was accommodated during the year 1920, and the maximum was only 8 in recent years. Mr. Amery said he understood that last year the hospital was not open at the time that the patients from Hong Kong were usually sent, but he would inquire further into the matter and see if any economy could be effected.

Unsweetened Condensed Milk.—Mr. Doyle asked the President of the Board of Trade, on April 7th, whether he was aware of the proposed standard for unsweetened condensed milk being about 12½ per cent. below the minimum cream contents recommended by the great weight of evidence heard by the Committee appointed by the Minister of Health; whether this was against trade interests in this country—the standards proposed by the condensed milk industry, manufacturers, importers, and the trade in this country were based upon the description officially given to this article in the Public Chemists' Report for many years; and whether he would use his influence with the Minister of Health to fix a reasonable standard which could be met by producers in this country, and which importers should be required to reach if they desired to trade here. Sir P. Lloyd Graeme said he was aware that the proposed standard was lower than was recommended by English makers, but he could not accept the various suggestions made by Mr. Doyle. In determining the standard, consideration had to be given, not only to the interest of British manufacturers, but to those of other sections of the trade, and still more to the necessity of maintaining at competitive prices adequate supplies for the requirements of this country.

The Coroners' Remuneration Bill was read a second time on April 6th.

With the dissolution of the Ministry of Food the powers and duties of Food Controller as regards the output of intoxicating liquor were transferred to the Board of Trade. The Government are considering whether any, and if so what, restrictions on the quantity of beer should be maintained.

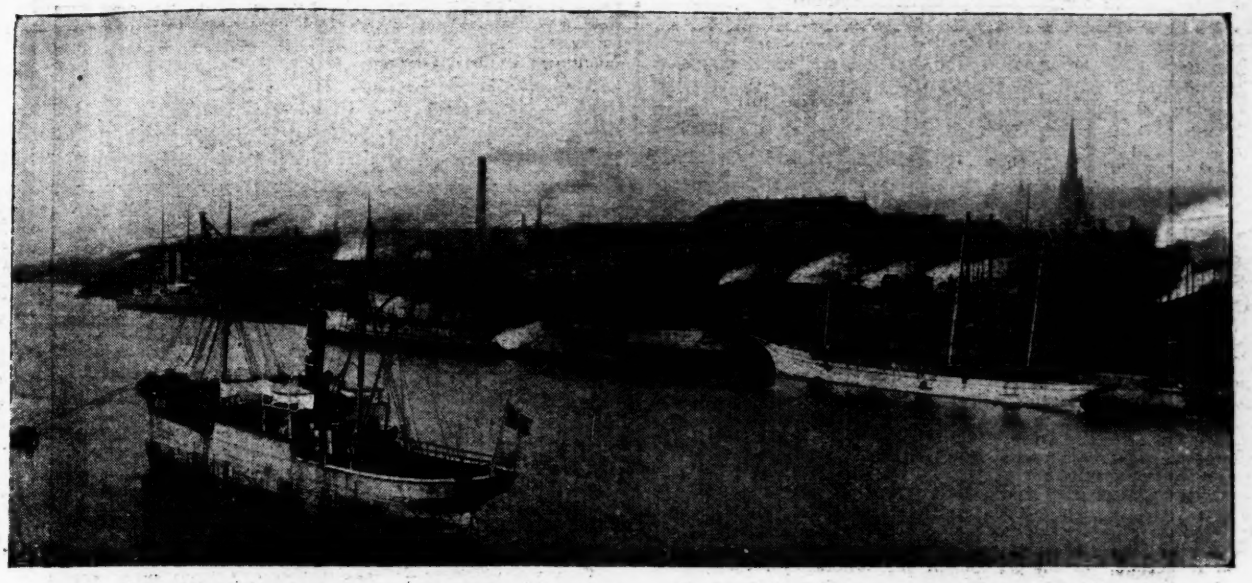
LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.

THE annual general meeting of the London and Counties Medical Protection Society, Limited, was held at 32, Craven Street, London, W.C., on April 6th. Sir JOHN ROSE BRADFORD, the President, was in the chair, and in moving the adoption of the annual report of the council he referred to the society's continued prosperity. During the year 733 new members had been elected, a net gain of nearly 500, bringing the membership up to well over 6,000. Almost alone amongst societies, this body had not found it necessary to raise the annual subscription above pre-war level. A great depreciation had to be recorded in the value of the securities held, but, inasmuch as these were—at least it was hoped—a permanent investment, the fact of depreciation was not so formidable as might appear. The credit balance on the actual working of the society during the year amounted to £1,755. He added that the results of lawsuits had been in the main favourable, but many cases had been satisfactorily settled out of court. The changing conditions of medical and dental practice had given rise to new dangers and difficulties, which meant increased work for the society in time to come.

Dr. C. M. FEGEN, the treasurer and chairman of council, said that the invested funds of the society amounted to some £30,000, which meant that if the society went into voluntary liquidation—a thing it had no intention of doing—every member would be entitled to take out £5, the equivalent of five years' subscription.

Dr. C. O. HAWTHORNE, while praising the report in general, criticized an item of 15 guineas which had been paid as subscription to the Federation of Medical and Allied Societies. He submitted that the subscription paid by members to their society was for a very narrow and specific purpose, which did not include medical politics. He moved an amendment asking the council to reconsider its decision. Sir JOHN ROSE BRADFORD said in reply that the matter had been considered very fully by the council, which had proceeded under an article definitely empowering it to take such action. Dr. FEGEN also defended the action of the council. Politics, he said, were entirely absent from its deliberations, and the action was taken because it was believed that the Federation could speak for a large number, if not the greater number, of members of the medical profession. The appointment of representatives to the Federation did not necessarily mean that the society endorsed the Federation's policy. The report of the council was then adopted.

Sir John Rose Bradford was re-elected president by acclamation. The vice-presidents, retiring members of council, the treasurer, and the general and financial secretaries (Dr. Hugh Woods and Mr. A. G. R. Foulerton) were all re-elected, with expressions of appreciation for their past services.



The Elswick Works at Elswick, Newcastle-upon-Tyne. (Photograph kind lent by Sir W. G. Armstrong, Whitworth, and Co.)

EIGHTY-NINTH ANNUAL MEETING

of the

British Medical Association,

NEWCASTLE-UPON-TYNE, 1921.

LOCAL INDUSTRIES.

COAL MINING.

NORTHUMBERLAND and Durham have long been known as the mining district of the North, and Newcastle-upon-Tyne and Coal are inseparably associated. There is evidence that the existence of coal in the district was known to the Romans, and that they used it for domestic purposes, but coal mining as an industry probably dates from the reign of Henry III. This monarch "by his letters patents . . . thought it fit to give them licence to dig coals . . . and to draw and convert them to their own profit. . . ." The industry has steadily developed from that time onwards, and has long been the mainstay of the north-east coast, for, as always happens when coal is plentiful, manufacturers of every kind sprang up and ever expanded in the district. A good idea of the extent of the industry can be gathered from a few facts concerning the Ashington group of collieries, the most important in the district and one of the largest in the world.

Our second illustration is of Ellington Colliery, one of the group, and typical of the very many collieries scattered about the Northumberland coalfield. There are seven shafts in this group, varying in depth from about 35 to 90 fathoms, and an average of about 9,000 tons of coal come to the surface each day. The work employs over 9,000 men and boys, and the collieries support a local population of about 30,000 people.

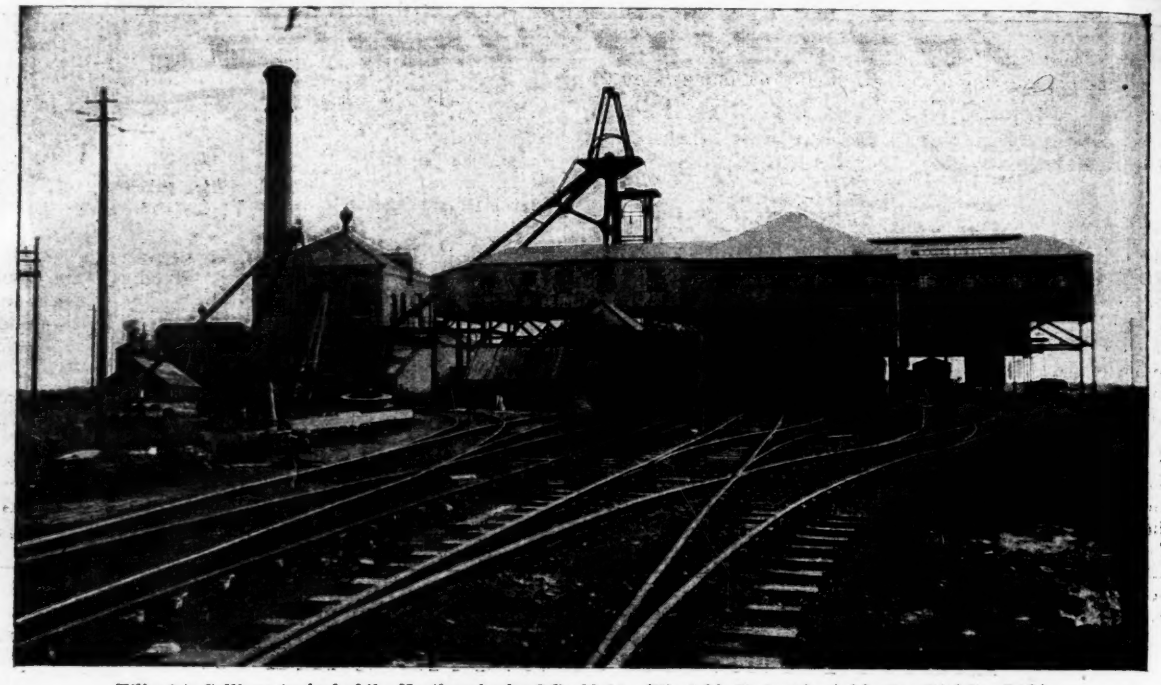
Much of the labour of "coal getting" is still done by hand with the pickaxe, aided by the use of explosives, but coal-cutting machines of various types, either driven electrically or by compressed air, are coming more and more into use. For bringing the coal from the workings to the shaft ponies and horses are still largely used, and at Ashington nearly 1,300 of these useful animals are employed. Accidents in coal mining are most often due to falls of stone, and to prevent this the roof is supported by timbering. It gives a good idea of the amount of work underground to mention that over 15,000 pieces of timber are used on an average every day.

The ancillary works connected with these collieries are enormous, and include a power plant with an aggregate of forty-seven Lancashire boilers and an electric plant generating current of 5,350 horse-power. Screening the coal is an important process conducted at the bank by mechanical means, but employing large numbers of boys and older men. The upkeep of the collieries requires staffs of workmen, such as masons, joiners, engineers, and officials of all kinds, while the transit of the coal from the pits calls for the use of extensive railways and rolling stock. A small proportion of the coal is used for domestic purposes, much is exported, but most is employed in local manufactories.

Some of the coalfields in this district have been fully developed and the best seams exhausted, but the advent of mechanical methods and of electricity have rendered it possible to utilize the smaller seams. Coal from this district in the form of coke is the principal fuel used for smelting the ironstone of the North Riding of Yorkshire. It was found that the type of coal was too soft and wasteful to use in its new state for blast furnaces. For years the coking process was carried out by beehive ovens, when any benefit from the waste heat and gases was lost. Means were devised by which the waste heat could be used for boilers, and this was followed by special by-product ovens of various types, which were designed for the separation of gas, benzol, tar, and ammonia. These processes have greatly increased the value of the industry, so that the by-products are now as important as the coke itself. In 1913 the two counties of Northumberland and Durham produced fifty-six million tons of coal, which constitutes a fifth of the total output of the United Kingdom.

Iron and Steel.

The iron and steel industry of this district is also known to have had its origin in Roman times. The ore was probably smelted by the aid of bellows made of bullocks' skins, and large masses of partly melted ore have been found, notably in 1909, at Corstopitum, near Corbridge. There are reasons for assigning to this collection a date approximating to A.D. 350–380. Relatively very little progress was made in the manufacture of iron until 1735, when Abraham Darby succeeded in bringing to the notice of the ironmasters the enormous advantages of coke. From this time onwards we find the County of Durham assuming an important position among British iron producers on account of the fact that the Durham coals are exceptionally well adapted to the production of coke of the best quality. At the present date there are numerous blast furnaces and rolling mills all

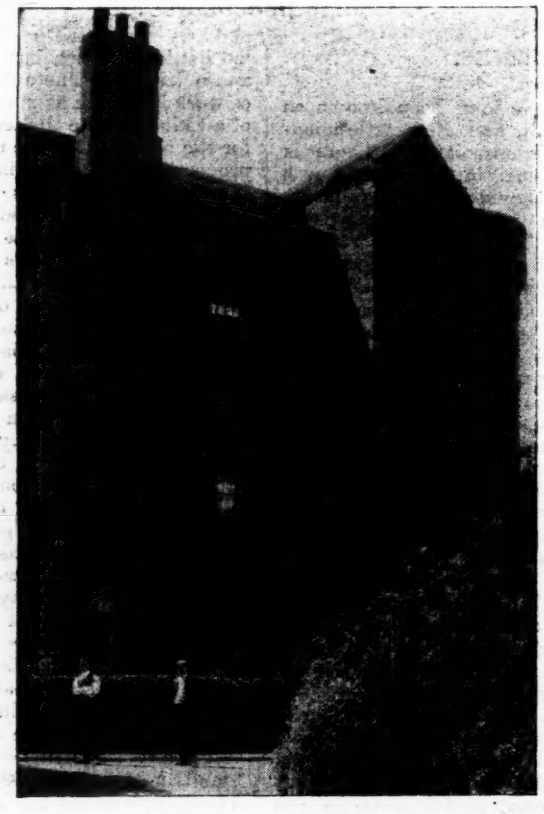


Ellington Colliery, typical of the Northumberland Coalfield. (Block kindly lent by Ashington Coal Co., Ltd.)

over Durham and a few in Northumberland, the ore being mostly obtained from abroad or from the Cleveland district of Yorkshire. These two northern counties yielded about one-seventh of the total British open-hearth steel output in 1913. There are two firms on Tyneside that regularly work electric furnaces, whilst two others smelt electrically some of the ferro-alloys employed in the manufacture of high-speed tool steel and other special steels of the highest class.

Ship-building and Marine Engineering.

Another of the great industries is that of ship-building. As far back as 1642 Newcastle was known as the nursery for shipping, and many of the "hearts of oak" that beat the seas in those days were cradled at the Tyne yards. By the nineteenth century, with the introduction of iron for ship-building, the Tyne rose to a position of still higher importance in the industry because of its inexhaustible wealth of iron and coal. The first iron ship to be built on the Tyne was the *Prince Albert*, launched in 1842 from Coutt's yard, now part of the extensive works of Swan Hunter and Wigham Richardson, Ltd. In 1844 Palmer's, of Jarrow, brought out the water tank system for ballast in place of the old system of sand and chalk, and since that day the characteristic "ballast-hills" of Tyneside have steadily disappeared. The development of armoured warships was largely due to the initiative of the Tyne ship-builders. This led to the construction, in 1856, of H.M.S. *Terror*, the first armoured ship in the world. The modern cruiser owes its existence to the first Lord Armstrong, of Elswick Works (see illustration, page 577). The first ship of this type was built there in 1884.



The County of Northumberland Agricultural Experiment Station, Cockle Park.

Of the naval works on the Tyne, special mention should be made of Armstrong's and Palmer's works. In 1897 Sir Charles Parsons introduced the steam turbine for marine purposes, and it is now used in many forms of ship. The list of warships built on the Tyne propelled by steam engines is a very long one, and to the various types already mentioned may be added destroyers, submarines, and monitors of several different designs. In recent years oil has to a large extent superseded coal as fuel.

The construction of merchant ships has for long made the north-east coast famous. Some builders have specialized in general cargo boats, whilst others have won fame by building passenger ships and boats for special purposes, such as colliers, trawlers, oil tankers, and other types. The best known passenger and mail steamship of recent years is the Cunard Company's express mail steamship *Mauretania*, built in 1907 by Swan, Hunter, and Wigham Richardson's, and a sister ship to the ill-fated *Lusitania*. Parsons's steam turbines drive her four propellers, and it is a tribute to Sir Charles Parsons's genius that in less than ten years after the appearance of his little ship, the *Turbinia*, it was decided to install turbines of his design in ships which at the time surpassed all others in size.

In conjunction with ship-building, ship repairing has always been an important industry on the north-east coast. Many notable cases of ship surgery have been successfully taken in hand. Floating docks of all sizes have been constructed and exported to all parts of the world. The general equipment of the shipyards on the Tyne is well abreast of the time, and the enormous floating and stationary cranes are famous the world over. The

tonnage launched from the Tyne and the Wear for twenty years previous to 1914 was rather more than half the total of the United Kingdom.

Marine engineering is also an important industry on the Tyne. This is essentially a modern development, its entire history dating from not more than 100 years ago, but it is of paramount importance where shipbuilding is concerned.

Other Industries.

Electrical industries are also well to the fore: it was on the Tyne in 1879 that the incandescent lamp was produced in a practical form. During the century perhaps the most remarkable industrial development in the district has been the production of electricity on a large scale, both for lighting and as a means of power. In many of the collieries and shipyards it has taken the place of steam, and is becoming more used every year. For considerably more than a century the manufacture of lead has been an important industry in Newcastle, lead ore being extensively mined in Tynedale, Allendale, and Alston, and smelted in the neighbourhood. The local production of the ore now is far from sufficient for the requirements of the lead manufacturers, who import the greater part of their supplies from Spain, Greece, Mexico, and Australia. Quarrying is a very minor industry. The product is limestone, mostly used as a flux in blast furnaces; rather more than three million tons were produced in the two counties in 1913.

Agriculture in Northumberland.

But though the Tyne and its banks together with the south-eastern corner of the county represent a mining and manufacturing district known the world over, the greater part of Northumberland is agricultural. Arable farming, dairy farming, and sheep rearing are each extensively practised, the latter especially among the sequestered hills and valleys of the Cheviot Range:

> Where the curlew screams in its wild retreat,
> And the fleet hare bounds from its lowly seat;
> Where the moor fowl crouch on the heather bed,
> And the restless plover wails overhead.

The importance attached to agriculture is reflected at the Cockle Park Experimental Station, where most valuable research work has been carried on since 1896. The tower at Cockle Park Farm (shown in the third illustration) is a reminder of the troublous times when the farmhouses were fortified against the attacks of the dwellers in the "debatable land."

England and Wales.

THE FUTURE OF BRISTOL UNIVERSITY.

AT a luncheon which took place at the Royal Hotel, Bristol, on April 7th, Sir Isambard Owen, M.D., Vice-Chancellor, made a speech on the future of the University of Bristol. He asked why the communities of the South-West should not re-establish their former position of leadership in the new era of progress. The important question for industry was, How long would the empire of coal over industry last? It was already threatened by oil, and geologists and chemists were endeavouring to find other substitutes. All round the coast of the West of England were reservoirs of power that needed only to be harnessed to be placed at the disposal of man. A proposal to that end was under consideration, and, if carried out, it would cause a great alteration in existing conditions. The West of England was ready for whatever might happen. A great service had been rendered by the establishment of technical colleges and the advantage of technical knowledge had been proved in recent years.

Having given a description of some of the features of the university buildings, Sir Isambard Owen said that unfortunately the cost of the new developments had increased enormously since the war. Only one-third of the cost of maintenance could be covered by the fees. The Government was doing what it could to add to the resources; the Corporation of Bristol had nearly doubled its grant, whilst the committees of Gloucester and Somerset and the cities of Bath and Gloucester had undertaken to contribute. The time had come when Bristol University must complete its equipment and make ample provision for its future working. If the universities of England were to preserve their freedom of action, the means must be supplied. A university dependent upon the Government was not free, and when a university lost its sense of freedom it lost in its usefulness, and its output of original work was lessened. Hence an appeal was being made to the public of the entire district that Bristol University was designed to serve.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

The annual meeting of the President and General Council of King Edward's Hospital Fund for London, to receive the accounts and the report for 1920, was held at St. James's Palace on April 12th, with H.R.H. the Prince of Wales in the chair. The total receipts for the year were £480,431, of which £255,365 was the sum received from the Joint Committee of the British Red Cross Society and Order of St. John of Jerusalem. The amount distributed was £700,000; of this the distribution of surplus Red Cross funds in aid of schemes of extension and improvement accounted for £250,000, the emergency distribution £250,000, and the ordinary distribution £200,000. The amount of the emergency distribution was taken from reserve funds held in cash or short-dated securities, as also was the sum needed to maintain the ordinary distribution at its previous figure. The effect of this was to reduce the reserves by about one-fourth, and the income from invested funds by about £16,000. The Council made this sacrifice in the hope that, with the aid of others interested, time might by this means be secured for the reorganization of hospital finances. They consider, however, that any repetition of such a drain on the invested funds and on permanent income would be disastrous to the Fund and to the hospitals. The Council pay a warm tribute to Sir John Tweedy, F.R.C.S., on his retirement from the chairmanship of the Distribution Committee, in which post he has been succeeded by Sir Cooper Perry, M.D. The problem of hospital finance was continuously before the Finance Committee of the Fund throughout the year, and the report ends by calling upon all who believe in the voluntary system to make a special effort to support the hospitals during the present crisis, and to ensure that voluntary contributions form at least a substantial part of their income in the future. The Prince of Wales in his short address voiced the general feeling of the Council when he said: "I think we are all very glad that Lord Cave's committee have reported so decidedly in favour of the voluntary system of hospital management."

THE GREAT NORTHERN HOSPITAL.

The Committee of Management of the Great Northern Central Hospital, Holloway, having considered a report of the Conference on National Health convened by the Faculty of Insurance, has expressed the following opinion for transmission to the British Hospitals Association and the press:

(*a*) Insured persons treated both as in- and out-patients should be paid for in full by approved societies.

(*b*) Payment should be made to the hospitals by the societies concerned by means of capitation grants, and not by the handing over of lump sums.

(*c*) In view of the general public's limited opportunities of gaining knowledge of voluntary hospital questions, an effort should be made to form a Volunteer Hospitals Publicity and Propaganda Committee, towards the funds of which all hospitals should be invited to subscribe according to their number of beds and out-patients.

(*d*) Such a Committee should consist of hospital representatives with some of the best publicity experts. It should endeavour to promote the interests of voluntary hospitals generally, and leave it to individual institutions to make known their particular needs.

ANTHRAX IN SHAVING BRUSHES.

Dr. William J. Howarth, Medical Officer of Health for the City of London, in his last monthly report refers to the circular letter by the Ministry of Health indicating the action to be taken in connexion with cases of anthrax attributed to the use of infected shaving brushes, an account of which was given in the BRITISH MEDICAL JOURNAL of February 5th, 1921, p. 207. A method of partial disinfection of all brushes was described in the

circular, but, as Dr. Howarth points out, complete sterilization of the brushes is impracticable, and while the formalin method may be relied upon to free the exposed part of the hair from infection, it does not affect spores embedded in the handle of the brush. He records that in the City of London he received every assistance from the various city traders who had been affected by the discovery of anthrax in Japanese shaving brushes. They all, without exception, readily complied with any suggestions made by him, and many of them voluntarily asked him to undertake the destruction of their stock of suspected brushes rather than incur the risk that would attach to their sale. A table is given in the report showing the numbers of each pattern of brush that had been destroyed up to March 12th, 1921. In all, 13,224 brushes were destroyed, and one box of bristles. In each case a certificate of destruction was issued to the owners.

Scotland.

CONFERENCE OF SCHOOL MEDICAL OFFICERS.

THE Association of School Medical Officers of Scotland held a conference in Edinburgh on April 7th and 8th, with Dr. A. E. Kidd as president. At the opening session Dr. John Macpherson said that it was an extraordinary thing how little attention had been directed to the great promise for the future that the medical examination of school children held out. Apart from its remedial and preventive functions, it should eventually introduce a general survey of the population whereby the utility of each citizen would be known and placed at the service of the State. Defects which the recruiting for the army had shown up might have been avoided if the system had been in existence thirty years ago. Dr. F. C. Shrubsall, medical officer of the London County Council, spoke on the subject of mental deficiency. He pointed out that the individual must be treated as a whole, and that it was not sufficient to say because a boy failed to pass nine out of ten tests that he was defective; it depended on a study of the history, the physical examination, and the clinical examination of the individual. Family history also was of importance, but it must not be overweighted. In mental testing it was usual to assess general intelligence by one or other of the graduated series of tests, but it was important that these tests should not lay too much stress on verbal imagery. In assessing the individual the certifying officer ought to feel sure that with a similar upbringing and in similar conditions he himself would have acted differently.

At the second session, which was presided over by Professor A. Darroch, chairman of the Edinburgh Education Authority, Dr. Norman Walker spoke on skin diseases in school. He said that pride of place among skin diseases in schools must be given to scabies. In every war scabies had been one of the chief causes of incapacity, and after every war the facts regarding it had been carefully collected, carefully printed in reports, carefully bound—and carefully put away. If a tenth of the skill that was put into tracing small-pox contacts were devoted to scabies it could very soon be absolutely stamped out. A more difficult problem was that of ringworm. It would be of enormous value in the campaign for the removal of that disease to know the actual number of children who were absent from school on a given day on account of ringworm. In the towns it would be found to be a number which would be rather surprising. At the afternoon session, with Dr. J. Mattie in the chair, Dr. Angus MacGillivray, reader in Ophthalmology at St. Andrews University, spoke on "The educationally blind child." He said that the rational treatment of short sight should be based on an accurate knowledge of the causes of the condition, such as holding a book too near the eyes and stooping over the work, especially in bad light and bad hygienic conditions. Proper posture while at work should, therefore, be insisted upon. The children at the Myope School were educated without any books, the teacher at the blackboard being the book. The chief feature of the teaching at the Blind School was that the pupils were taught to do their work sitting erect, stooping being prohibited, and after a few weeks the child was quite independent of his eyes for near work, learning to read his Braille type by touch.

On the following day the conference was resumed by a lecture by Professor Georges Dreyer of Oxford University, on "The assessment of physical fitness," with Sir Leslie Mackenzie, of the Scottish Board of Health, which had arranged the lecture, in the chair. Professor Dreyer said that those who were concerned with the question of physical fitness were often faced with the difficulty of making up their minds definitely whether they were face to face with people who were of a lower kind of physique than they should be. In the past investigators had had to rely largely on their impressions, helped by certain measurements. Most of the existing tables dealing with the size of the normal human body were based on the theory that definite relationships existed between the age, height, and weight of the individual. His own conclusions were that there was no definite relationship between age, height, and weight which could compare in accuracy with the relationship which did definitely exist between weight, trunk length, and the circumference of the chest—relationships which were unaffected within wide limits by age. Recreation, occupation, and disease affected very considerably the development of the legs, so that the height was an uncertain and unsatisfactory measure to use in relation to weight. After the lecture a demonstration of the apparatus and methods of measurement was given by Dr. F. G. Hobson of Oxford University. At the afternoon session, which took the form of a joint meeting with the Scottish League of Organizers and Teachers of Physical Training, the subject of discussion was "Physical education," Mr. James Malloch being in the chair. The discussion was led by Dr. Alister Mackenzie, Principal of the Dunfermline Training College, who appealed for co-operation between the physical training expert and the school medical officer.

GYNAECOLOGY AT THE EDINBURGH ROYAL INFIRMARY.

At a meeting of the managers of the Edinburgh Royal Infirmary, on April 4th, reference was made to the expiration of Dr. A. H. Freeland Barbour's term of service as gynaecologist to the Royal Infirmary. The managers placed on record their recognition of the skill and attention he had brought to bear on the duties of his office during the thirty-five years of his connexion with the department, and of the sympathy and tender care patients had received at his hands. In consideration of his valuable services he was unanimously appointed consulting gynaecologist to the institution. At the same meeting regret was expressed at the loss of the services of Dr. N. T. Brewis, who was appointed assistant physician in 1901, and in 1906 took charge of one of the gynaecological wards. The managers placed on record their sense of his eminence as a clinician, which, along with his sympathetic manner, not only endeared him to his patients and colleagues, but secured for him the esteem of the profession generally. It was agreed to ask him to accept the post of consulting gynaecologist.

HOUSING IN SCOTLAND.

The annual Scottish National Housing and Town Planning Congress will take place in the City Chambers, Edinburgh, on April 19th and 20th, with Sir Henry Ballantyne, Chairman of the Royal Commission on Housing in Scotland, in the chair. The Congress will be attended by representatives of county councils, town councils, architectural and technical associations, and associations of employers and workers, and will consider various housing and town-planning questions, more especially those of an urgent character, such as the need for the adherence of the Government to the programme for which legislative provision was made by the various Acts of 1919. The fixing of rents, housing finance, the management of housing estates, standards of construction and design, and the preparation of schemes for carrying into effect the recommendations of the Royal Commission on Housing in Scotland, will also be under the consideration of this Congress.

PROFESSOR LUIGI CAROZZI, medical inspector of industry and labour in Italy, has been nominated head of the Service of Hygiene at the International Bureau of Labour in Geneva.

Correspondence.

THE SCIENCE OF ETIOLOGY, OR THE NEW EPIDEMIOLOGY.

SIR,—Your "distinguished bacteriologist" says that the method of the newer epidemiology, "instead of accumulating facts in laborious fashion, aims at a solution of the problem by postulating causes, and apparently by eliminating the principle of specificity."

What "new" epidemiologists renounce the laborious accumulation of facts? Is it Dr. Brownlee, whose conclusions are based upon many years of clinical experience as well as upon the statistical records of generations? Is the Medical Officer of the County of London really an epidemiological Lady of Shalott isolating herself from the laboriously accumulated facts of disease?

Because there is a whole group of etiological momenta common to the enteric group of diseases, another group common to the venereal diseases, many epidemiological affinities between scarlet fever and diphtheria, and so forth, and because epidemiologists, whether "new" or old, subject these factors to statistical or historical examination, is there any sense in accusing them of eliminating the "principle of specificity"? One may recognize something without perpetually chattering about it.

If any "new" epidemiologist supposes that the whole problem of etiology can be solved by doing sums or by reading the collected works of Sydenham, he must be a very foolish man. If any bacteriologist thinks that the elimination of, say, epidemic disease of the typhoid group can be secured by immunizing the population first against *B. typhosus*, then against paratyphoid A, paratyphoid B, paratyphoid C, and so on to the end of the alphabet, all other things remaining constant, he must be rather *naïf*. I have not myself met an epidemiologist of the former or a bacteriologist of the latter class, and surmise that the names of such persons are John Doe and Richard Roe.

I do not believe that anything is gained by setting up these scarecrows; your distinguished correspondents can surely do something better than that.—I am, etc.,

Loughton, April 10th. MAJOR GREENWOOD.

TRANSFIXION OF THE BODY.

SIR,—In your issue of April 9th Dr. S. D. Clippingdale has referred (p. 550) to the specimen of the gig shaft now preserved in the Museum of the Royal College of Surgeons, London, but with such lamentable surgical inaccuracy that I feel it incumbent to put the real facts of the case before your readers. I may cite, with omissions, from the account as given in the last edition of the *College Catalogue*, 1915, drawn up by Mr. C. F. Beadles and myself. Besides the gig shaft (No. 2241.2), which is perfectly entire, the Museum contains part of the anterior wall of the thorax (2216.2), through which the shaft was driven ten years before death. The shaft entered on the left side, between 3 in. and 4 in. from the sternum, was driven across the mediastinum, and passed out of the thorax about 3 in. from the right side of the sternum, between the second and third ribs; the tug iron of the shaft penetrated the chest and the lung rather lower down on the left side, between the third and fourth ribs. The patient, in the circumstances cited by Dr. Clippingdale, felt the end of the shaft perforate his side under the *left* arm, which was raised high up, and as the horse continued plunging he felt it pass from under his *right* arm. The patient's cries very shortly brought assistance, and the horse having been put back, he, with the aid of those who had come to him, drew himself off the shaft on which he was impaled. On the ninth day it was first thought prudent to move the patient sufficiently for completely undressing him and examining the wound; from this time he gradually recovered.

Placed immediately before this there is also in the College Museum (No. 2215.1) the pivot of a try-sail mast which passed completely through the body of a sailor, traversing the chest and upper part of the abdomen; complete recovery ensued. An excellent water-colour drawing of the patient made by Clift, the first conservator, is exhibited by its side; the drawing shows the healed entry and exit. The pivot, after passing obliquely through the body, penetrated the deck. The mast was 39 ft. long and about 600 lb. in weight. The man was carried to the London Hospital, where, under the care of Mr. John Goldwyer Andrews, he recovered in five months so as to be able to walk. He ultimately returned to his duty as a seaman.—I am, etc.,

S. G. SHATTOCK, F.R.S., F.R.C.S.,
Pathological Curator, Royal College of Surgeons of England.

April 13th, 1921.

ASTHMA AND ANAPHYLAXIS.

SIR,—In response to Dr. James Adam's letter of March 26th and other letters, for which I beg to thank the writers, commenting on my article of March 12th, I should like to make the following observations:

We may liken the solving of the asthma problem to doing a difficult jigsaw puzzle. The first thing to do is to display all the pieces, if none are missing; the second to fit them in to each other; we may then admire the completed picture. Now I only claim that anaphylaxis is an important "piece" and that it can be shown to fit many other pieces, but it is not the whole picture, nor do I think it any simplification to say, as Dr. Adam does, "The extreme sensitiveness displayed by these patients to minute doses of hundreds of substances, harmless to ordinary individuals, indicates an extraordinary unstable metabolism." I think it indicates anaphylaxis, or, at any rate, it is simpler to say so.

On the other hand, I know Dr. Adam's most excellent book almost by heart, and have been able to cure many patients simply by conforming rigorously to the early evening meal, the weekly starvation, and purge.

But again this is only a piece of the puzzle and not the whole picture; nevertheless it very nearly fits the anaphylactic pieces. In this late meal, overfeeding, week-end, type of case, complete digestion and the breaking down of proteins to peptones and amino-acids is interfered with. The stomach is given more than it can deal with, or the starches, fats, and proteins may be so intimately mixed in the cooking that the proper digestive fluid and service for each is unable to reach them. Un-broken-down proteins may then pass through the intestinal wall, whence, unless stopped by the liver, they will enter the general circulation, initiate a "hémoclasique crisis" followed by an attack of asthma some hours later, that is, in the middle of the night.

Surely the essential condition in the lung is a spasm of the bronchiole muscle, which has been abundantly demonstrated in sensitized animals. The lungs of a sensitized animal are removed from the body and alternately expanded and deflated with an air pump, they are then perfused with a fluid to which the animal is sensitive; the bronchiole muscle at once shuts down and the typical picture of asthma occurs. I do not find the week-end type as common as Dr. Adam does, and there would be no difficulty in parading a dozen asthmatics who started their asthma during the war under those ideal conditions which one knows stopped not only asthma but migraines and many other of these chronic complaints.

Dr. Adam finds a flaw in the anaphylactic theory of asthma because of the periodicity of the asthmatic attacks, which periodicity is absent in anaphylaxis. My argument is that asthma is an anaphylactic phenomenon and will occur each time an exciting dose of the protein enters the patient who is sensitive to it, whether it be in the Christmas holidays every time the small boy empties a plate of nuts, or three times a week during the hunting season, or every week-end when Demos fills himself up to the neck. It is not a periodicity of the asthma but of the cause of this anaphylactic symptom.

I join most heartily with Dr. Adam in his call for research, for which asthma and these allied complaints offer an immense field. Who will tell us what the eosinophilia means? Or why, when I obtain a skin reaction to oats as big as a halfpenny, does the child not become covered with urticaria after a plate of porridge, but instead has an attack of asthma?

The inter-relationship of asthma or sensitization and tuberculosis is too complicated to touch on in a short letter, but extremely important. With regard to giving serums by the mouth, others are better qualified than I am to answer this. New French work suggests that mixture of sodium hyposulphite with the serum will obviate anaphylactic symptoms. I have not the paper by me, but will

send the reference to Dr. Allison. But in no case should horse serum be given to asthmatics—so many of them are sensitive to horse, so that the first dose is poisonous. Most of the deaths that have occurred after horse serum have been in these horse asthmatics.—I am, etc.,

London, W.1, April 11th. FRANK COKE.

ADRENALINE IN RESUSCITATION.

SIR,—I have read the letter of Lieut.-Colonel Marjoribanks, in your issue of April 9th, in which he asks me one or two questions.

I agree with him that dilution of drugs with the blood can be secured to any extent, and that the rate of injection of an intravenous solution is quite as important as the strength of the solution.

There is one point, however, which he misses in relation to resuscitation. A person who has been drowned, or is in a state of what we may call temporary death, is necessarily a person whose circulation has stopped. Under such circumstances it is quite useless to inject any drug into the blood, as it cannot have any effect owing to the absence of circulation to carry it on to those parts of the body where it can act. Adrenaline acts upon the peripheral vessels of the circulation, chiefly upon the peripheral arterioles, and in order to get it there when we are using adrenaline for the purpose of resuscitating any body, it is necessary to temporarily establish an artificial circulation in order to carry the drug to the periphery. For this reason the intravenous infusion of saline solution, or gum solution, is necessary in a quantity of two pints, or even more. Adrenaline must, I think, be introduced in this solution in a dilution of about 1 in 50,000, or a small quantity of liquor adrenalini hyd. (*B.P.*) must be injected into the circulation while the infusion is in progress. It would, in my opinion, not be safe to give a 10-minim dose of adrenaline and follow this with the saline infusion, as too big a dose of adrenaline would reach the peripheral circulation at one time. For this reason I advocate the use in such cases of diluted adrenaline solution in the infusion fluid.

It is just here that the necessity comes in for a person skilled in adrenaline transfusion being present, as it is impossible, so far as I am aware, to lay down an exact rule with regard to the dose of adrenaline that will have to be administered. Infusion should be stopped as soon as the heart starts and the circulation is re-established, and then resumed in small quantities if the circulation shows further signs of failing. The action of adrenaline is violent, even in minute doses, and also very transitory, its effects disappearing in about two to three minutes.

I am afraid I cannot answer Colonel Marjoribanks's last question more accurately than to say that I believe that where the circulation has stopped it will be necessary to give an intravenous infusion of water, or better still salt solution, containing adrenaline in the dilution of about 1 in 50,000, up to from two to three pints, and that when this has been administered the heart will probably restart, either by itself, or with a very slight stimulus, such as the prick of a needle, or pressure from without through the chest wall.—I am, etc.,

J. P. LOCKHART-MUMMERY, F.R.C.S.

London, W., April 9th.

IRRITABLE BLADDER.

SIR,—The condition described by Dr. James Hamilton (March 26th, p. 480) seems to me to be especially dependent on the loss of normal contractility of the perineal portion of the urethra. This portion has the thinnest and most easily dilated walls, and in these cases it is always possible, after the bladder has been emptied, to squeeze from it a few drops of urine.

These patients are always told to empty the bladder and even to "milk" the prostate; the real object, however, should be to empty that part of the urethra thoroughly. If this is not done the small quantity of urine retained becomes, I believe, inspissated by absorption of its water, and so more irritant. The more irritant the urine in the first place, the more irritant is the inspissation, and hence one cause of occasional excess of irritability.

The emptying of this part of the urethra should be done by pressure with the fingers from the anus to the front of the perineum, repeated fifteen to twenty times after micturition, the anterior portion being also carefully emptied until no further drop can be squeezed from the fossa navicularis. Any retained urine tends to be passed down to the fossa, so that an examination fifteen or twenty minutes after micturition will show whether the process has been successful, and any residue should be got rid of. If this is thoroughly carried out the intervals between micturition are at once lengthened. The rigour of treatment may be relaxed after a time, but vigilance is always necessary.

The theory of inspissation has not been verified, but the success of the treatment is a practical fact.—I am, etc.,

April 5th. OCTOGENARIAN M.D.

SALVARSAN AND THE WASSERMANN TEST.

SIR,—In the issue of the JOURNAL dated March 19th, 1921, is published a paper on the treatment of syphilis by salvarsan. In that paper it is laid down that (1) salvarsan exercises a direct lethal action on the *Spirochaeta pallida*, and that (2) the Wassermann test indicates the presence of living spirochaetes.

Are we to conclude that this teaching is now accepted generally by the profession, and, if so, is it then the duty of those who undertake the treatment of syphilis to persevere with salvarsan until the reaction is negative, and is one to look upon all who exhibit a positive Wassermann reaction as requiring salvarsan treatment?

On the same morning lately I saw two patients. One was a woman with untreated syphilis of five years' standing and undoubtedly ill. Her reaction was negative, but became positive after a dose of salvarsan. The other was a man of 65, who admitted to gonorrhoea forty years ago but was positive he never had syphilis. Being a seafaring man he was naturally expert in the diagnosis of syphilis, and I believed his statement. He had none of the stigmata of congenital syphilis, and no signs of parasyphilis. His reaction was strongly positive. The tests were carried out by Professor Beattie of Liverpool—a sufficient guarantee of their accuracy.

Such experiences are not uncommon in venereal work, but they do not seem capable of explanation by the generally held views.

Is it not possible that salvarsan, instead of directly killing the spirochaetes, stimulates the body to do so by affecting its particular mechanism of defence against syphilis, and that it is the activity or lack of activity of this mechanism of defence which is demonstrated by the Wassermann reaction?

In the *Medical Century* (1914) is reported an experiment conducted by a Dr. Mellon of America, who administered to healthy students large quantities of a drug known as *Baptisia tinctoria*, causing the production in their blood of an agglutinin which would agglutinate typhoid bacilli, and proving thereby that a drug could be as successful an antigen as the disease toxin, and could influence the serum reaction in the same way as the disease.

In the light of this view the phenomenon of a positive reaction after a provocative dose of salvarsan is explained by the stimulation and resuscitation of a temporarily overwhelmed resistance. Looked at from the more generally accepted point of view it is difficult to explain, as, if salvarsan kills spirochaetes and the positive Wassermann is a proof of living spirochaetes, the chances of a negative reaction after the provocative dose ought to be greater than before it was given.

If salvarsan does act by stimulating the body's mechanism of defence against syphilis, may it not overstimulate it, paralyse it, destroy it? The negative Wassermann reaction, after a course of treatment, may mean a paralysed defence, with its increased liability to reinfection, relapse, or an earlier advent of the parasyphilides.

If this is so, then damage is being done every day with conscientious thoroughness.—I am, etc.,

Liverpool, April 5th. F. B. JULIAN, M.B.

GLANDULAR FEVER.

SIR,—During the eleven years that I was school medical inspector to the West Riding County Council I had the opportunity of seeing a very large number of children suffering from the condition which Drs. Letheby Tidy and Morley call glandular fever. The symptoms were always the same—slight malaise and pyrexia, and com-

plaint of sore throat and difficulty of swallowing out of all proportion to the very slight objective changes that were observed in the fauces. The characteristic symptom, however, was the enormous enlargement of the submaxillary and peritonsillar lymphatic glands. This enlargement started on the second day of the disease, and continued to increase for about a fortnight, then remained stationary for some weeks and very gradually subsided. In many cases the condition of the glands suggested that they were going on to abscess formation or had become tuberculous, but I can say definitely that in no case did either abscess or tubercle develop.

The disease was met with always in epidemic form. I was able to fix the incubation period at three days. The epidemics were usually somewhat extensive, in many cases involving 25 to 40 per cent. of the children attending the same school. The last epidemic that I remember was at Adel School, near Leeds, in, I think, 1917. Epidemics of this disease were extremely frequent on the South Yorkshire coalfield, and in the neighbourhood of Leeds. The public invariably called the condition mumps. I have never seen the disease outside the West Riding of Yorkshire.

My attention was first called to the condition from noting how very frequently epidemics of mumps were recorded in the schools in the West Riding. During some years I kept a record of the cases I had seen. They numbered several hundreds, but I regret that at the present moment I cannot put my hand upon my records. —I am, etc.,

DUNSTAN BREWER,
Medical Officer of Health.

Swindon, April 9th.

SCURVY IN A BREAST-FED INFANT.

SIR,—In the review of Professor A. F. Hess's *Scurvy Past and Present* (BRITISH MEDICAL JOURNAL, January 15th, p. 85) he is said to make a statement to the effect that "infants brought up on natural milk do not contract scurvy." Some four or five years ago a strong, stout, healthy country woman whom I had confined, brought her child, only a few months old, to me, very bad indeed with scurvy. After examining the child I said, "If you lived in London, I would say your child had scurvy," and added that I had not seen a case for over fifteen years. Luckily I finally decided that it was scurvy in spite of the fact that the child was purely breast-fed, and I ordered orange juice, etc. On questioning the mother I found that she had been practically living on pickles, vinegar, and bread. The child was purely breast-fed, and on altering the mother's diet, etc., the child rapidly recovered.—I am, etc.,

A. NORRIS WILKINSON,
M.R.C.S., L.R.C.P.

Inglewood, Vic., Australia,
February 16th.

MEDICAL REGISTRATION.

SIR,—In view of recent legislation and prospective regulations, I am directed to remind you that a medical practitioner, no matter what qualifications he may possess, is not "legally qualified" or "duly qualified" unless he is registered; and that the *Medical Register* is alone evidence upon this point "until the contrary is made to appear." There is no other book of reference which takes its place.

I am always pleased to answer inquiries by telephone (Langham 2500), or, better still, by letter, and to give all the information I possess in regard to practitioners. For those who specially require them, lists are prepared each month giving the names of all those registered during the month, and also of those who have died or whose names have been removed from the *Register* for any other reason.—I am, etc.,

NORMAN C. KING,
Registrar.

General Medical Council,
44, Hallam Street, London, W.1,
April 7th.

THE Government of Panama have assigned ten million dollars for the erection of an institute for tropical diseases in memory of the late Surgeon-General Gorgas.

THE second congress for Italian sanitary industries will be held at Parma in June, a little more than a year after the first congress, which was held at Milan. There will be an exhibition of medicinal plants and pharmaceutical apparatus and accessories.

Obituary.

PETER THOMAS DUNCAN, M.D.,

Consulting Physician, Croydon General Hospital.

WE regret to report the death, which occurred with tragic suddenness on Wednesday, April 6th, of Dr. Peter Thomas Duncan, of Croydon, in his 73rd year. He was acknowledged in the town as *facile princeps* in diagnostic skill. When in doubt or difficulty his aid was frequently sought by his brethren, and readily given to the last, for he died in harness, as he wished. His early life was a constant struggle against difficulty, but his indomitable pertinacity overcame all, and his career was distinguished. He received his medical education at University College Hospital, and in 1874 graduated M.B. with honours and B.S. with gold medal in surgery in the University of London. He took the M.D. in 1876, when he qualified for the gold medal. He held the office, then called physician's assistant, now known as house-physician, and was a Fellow of University College.

He settled in Croydon and became physician to the Croydon General Hospital. From 1885 to 1893 Duncan was secretary of the East Surrey District of the British Medical Association, and in 1897 was president of the South-Eastern Branch.

The tributes we are able to publish from Sir Rickman Godlee and from Sir James Purves Stewart will explain Dr. Duncan's qualities as a practitioner of medicine. He was also remarkable for his sound judgement and wise forethought in business affairs. He was from an early date head of a large partnership in Croydon, and in recent years had organized it thoroughly on the team system. The aim he had was to ensure continuity of treatment to the patient, an opportunity to each partner to follow his particular bent in practice, while ensuring to all greater stability and security. Dr. Duncan leaves a widow, a son, and three daughters, who with a large circle of patients and friends, mourn his loss. He was a cousin of the late Dr. Matthews Duncan, and a brother of the late Dr. William Duncan, gynaecologist to the Middlesex Hospital.

Sir RICKMAN GODLEE, Bt., who was a fellow student, writes: My feeling on hearing of Peter Duncan's death was that another familiar friend had gone; yet we had seldom met in past years, and probably should not have met again, for I, like so many others, had deserted my post, while he remained at his to the end. The real familiar days were long ago at University College in the seventies. There I remember him as a merry, hard-working student, who took many honours, held a resident appointment, was hail fellow well met with every one, and was liked and respected by us all. Then came the striving and penurious days of junior staff appointments, when I heard almost with jealousy of Duncan doing a large practice, but did not see much of him till I was old enough to be called into consultation. After that came many pleasant meetings scattered over many years. I looked forward to his genial welcome and his breezy manner and the pleasant chat over former days. But chiefly I was struck by his skilful and careful methods of diagnosis, his medical instinct, and his wisdom. He was one of those general practitioners from whom consultants, if they are wise, can learn much. There is no other way of picking up a very essential part of their knowledge, and few were so well able as he, though quite unconsciously, to impart it. And he was the leader and inspirer of a very vigorous band of colleagues; it is no small thing to be not merely one but the acknowledged head of such a distinguished body of men.

Sir JAMES PURVES STEWART writes: The news of Dr. Peter Duncan's death will be heard with sorrow by a wide circle of professional colleagues and friends. Starting his professional life with academic distinctions of the highest order, Dr. Duncan, in the course of a long and honourable career, accumulated a wide and deep knowledge of his profession and a shrewd judgement of men and affairs. Throughout a busy life his knowledge and experience were always freely at the disposal of his colleagues, many of whom, in moments of difficulty, turned to him for counsel and support, which were always freely forthcoming. A man of singular modesty and charm, his code of honour was a lofty one, and he was incapable of an ungenerous

thought or action. His friends, colleagues and patients, not only in Croydon but throughout the country, will condole with his widow and bright young family in their irreparable loss. He leaves behind him the memory of an upright man, a loyal friend, and an able physician—a heritage even more to be desired than the eminent position to which he deservedly attained.

J. HOPKINS WALTERS, M.R.C.S.,

Consulting Surgeon, Royal Berkshire Hospital, Reading.

WITH the death of Dr. James Hopkins Walters of Reading, at the age of 76, there passed away a notable character. Dr. Walters, who was a student at Guy's Hospital, took the diploma of M.R.C.S. in 1865, and he practised during his earlier days at Faringdon, Berks. In 1878 he moved to Reading, where he soon became one of the leading practitioners in the town, a position which he held until his retirement in 1913. He was on the active surgical staff of the Royal Berkshire Hospital from 1879 to 1904, and was then appointed consulting surgeon. He was president of the Reading Pathological Society for two years.

In his younger days Dr. Walters was a keen sportsman and an excellent shot; he also took a great interest in the Volunteers, in which for many years he was a surgeon-captain. In local politics he was a force with which to reckon, and he sat for a considerable period on the Reading Town Council. Always a fighter he had no hesitation in calling a spade a spade, and he stated his views, often original and always distinguished for sound common sense, in vigorous and picturesque language. He was a versatile writer, both in the medical press and in the lay journals. Although of the older school of medical men he was always receptive of new ideas. Even after relinquishing active practice in Reading he made a voyage half way round the world as a ship's surgeon. On the outbreak of war he volunteered for various posts which the authorities, on account of his age, were unable to grant him, and eventually he acted as medical officer to the regiment quartered in the town and to two V.A.D. hospitals.

On the eve of his death he had seemed in better health than usual, and had indeed played a game of billiards with keen interest at his club. Death occurred on March 4th suddenly in his sleep, as he had always desired—he was ever impatient of illness in himself.

JOHN WILLIAM FRY, M.R.C.S., L.S.A.,

Maidstone.

MAIDSTONE has recently lost the doyen of the local profession in the person of Mr. John William Fry, who died shortly after entering upon his 90th year.

Born at Greenwich in 1832, he was educated privately, and was in 1849 apprenticed to his uncle, Frederick Fry, F.R.C.S., surgeon to the West Kent Hospital, Maidstone, a gentleman of irascible temperament, who in the High Street once horsewhipped a fellow practitioner, and on another occasion hurled a row of filled medicine bottles at his unfortunate nephew's head. Harsh as were the conditions, Mr. Fry gained valuable experience, including that of cholera, an epidemic breaking out amongst immigrant hop-pickers at East Farleigh, attended with great mortality, the victims being buried in a common grave.

Leaving Maidstone, Mr. Fry entered at King's College Hospital, where he studied under Partridge and Ferguson. In 1855 he obtained the diploma of M.R.C.S.Eng., and became ship's surgeon to Messrs. Green and Co., sailing first to Australia and next to India in the *Nile* troopship, which reached Madras Roads a month after the outbreak of the Indian Mutiny, the troops being landed at once and rushed up to the relief of Lucknow. Returning to London Mr. Fry took the L.S.A. in 1859 and entered into general practice at Thaxted, Essex, where he again encountered a cholera epidemic at Great Sampford, taking up his residence in the stricken village and receiving the thanks of the Privy Council for his devoted services. In 1868 he moved to Wateringbury, Kent, where he practised for twenty-nine years, retiring to Maidstone in 1897, but again putting on harness to assist his fellow-townsmen in the typhoid epidemic which visited the town in 1898.

From his long connexion with Maidstone Mr. Fry was well known and much respected, and although he reached an advanced age, his interests remained many and his faculties unimpaired. He was an old member of the British Medical Association, and the oldest member of the Kent Medical Benevolent Society at the time of his death. He leaves three sons (all in the medical profession) and one daughter.

DR. CHARLES ALBERT HINGSTON of Plymouth died on April 5th, aged 78. He was educated at St. Bartholomew's Hospital and the University of Edinburgh, and graduated M.B.Lond. in 1864 and M.D. and B.Sc. in 1865. He took great interest in the Young Men's Christian Association, and was the moving spirit of the Western Counties division of that organization, to whose funds he generously contributed. For twenty-five years he was a director of the Devon and Cornwall Banking Company, now amalgamated with Lloyd's Bank. He was consulting physician to the Devon and Cornwall Ear and Throat Hospital and to the Plymouth Public Dispensary. Besides building a convalescent home, he established a deaf and dumb institute, and defrayed the cost of erecting a crypt at St. Augustine's Church. He was a member of the Plymouth Division of the British Medical Association.

THE sudden death of Dr. WM. MOIR of Darwen is recorded. He graduated M.B., C.M.Aberd. in 1892, and M.D. in 1897, took the D.P.H.Camb. in 1903, the B.Sc. (Public Health) Victoria University in 1908, and became barrister-at-law, Gray's Inn, in 1913. Before going to Darwen to succeed the late Dr. Armitage in practice he was medical superintendent of the Dunston Lodge Asylum, Gateshead-on-Tyne. He was one of the regional medical officers of the Ministry of Health under the National Health Insurance Acts for the North-Eastern Division of England. He was an ex-president of the Blackburn Division of the British Medical Association, and a member of the Society of Medical Officers of Health. He is survived by his widow and two children.

The Services.

R.A.M.C. AUXILIARY FUNDS.

THE annual meeting of the subscribers to the Auxiliary Royal Army Medical Corps Funds will be held at 11, Chandos Street, W.1, on Friday, April 29th, at 4 p.m.

HONOURS.

FOREIGN DECORATIONS.

THE President of the French Republic has conferred the Cross of Chevalier of the Legion of Honour upon the following in recognition of their services to the French sick and wounded at Hôpital Bénévole, No. 115 bis, at Villeneuve-sur-Lot during the late war: Dr. W. R. Dakin, Dr. F. M. Graham and Dr. A. Kirkpatrick Henry.

DEATHS IN THE SERVICES.

SURGEON-COLONEL GEORGE CUMBERLAND ROSS, Bengal Medical Service (retired), died at Milan on February 21st, aged 78. He was born on December 21st, 1842. The eldest son of the late Dr. Charles Amilius Ross, of Castleconner, co. Kilkenny, he was educated in Dublin, taking the L.R.C.S.I. in 1864, and the L.K.Q.C.P. in 1865. He entered the I.M.S. as assistant surgeon on October 1st, 1865, became full colonel on January 1st, 1894, and retired on October 1st, 1897. Most of his service was spent in civil employ in the Punjab, where he was for many years civil surgeon of the important stations of Delhi and Rawal Pindi in succession. On reaching the administrative grade, he filled the post of inspector-general of civil hospitals in the Central Provinces for a year, and afterwards the same post in Bengal. His son, Staff Surgeon G. C. C. Ross, R.N., lost his life early in the war in H.M.S. *Hawke* torpedoed in the North Sea on October 15th, 1914.

Brigade-Surgeon John Trehane May Symons, R.A.M.C. (retired), died at Cheltenham on March 11th, aged 87. He was born at Tintagel, Cornwall, on September 1st, 1833, took the L.F.P.S.G., the L.S.A. and the M.D. of Giessen University in 1855, and entered the army as assistant surgeon on December 8th, 1857, more than sixty years ago. In the regimental days he served in the Royal Artillery. He attained the rank of brigade-surgeon in 1883, and retired on September 1st, 1888.

Colonel C. H. Melville, C.M.G., A.M.S.(ret.), will give a lecture on "Some Lessons of the War," at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1, on Wednesday, April 27th, at 5.30 p.m. The chair will be taken by the Earl of Plymouth.

Medical News.

THE Royal Institute of Public Health will hold a series of conferences in London at the end of the first week in June. On Thursday, June 2nd, there will be discussions in the morning on municipal hygiene and its suggested connexion with the administration of the Poor Law and the future of voluntary hospitals, and in the afternoon on the housing problem. On Friday morning there will be a discussion on the prevention of ill health in industry, and in the afternoon on venereal diseases and the additional measures necessary for their prevention; on Saturday morning the discussion will be on the present machinery for dealing with tuberculosis. Further particulars can be obtained from the honorary secretaries, 37, Russell Square, London, W.C.1.

SIR LEONARD ROGERS has been appointed extra physician for clinical research and lecturer, and Lieut.-Colonel W. Clemesha lecturer on hygiene of the tropics, at the Hospital for Tropical Diseases and the London School of Tropical Medicine.

A THREE months' course of lectures and demonstrations in hospital administration for the diploma in public health is being given at the Western Hospital, Seagrave Road, Fulham, by Dr. R. M. Bruce, medical superintendent, on Tuesdays and Fridays, at 5 p.m. Applications should be made to the Clerk to the Metropolitan Asylums Board, Embankment, E.C.4, giving full name and address.

ON the recommendation of the Minister of Health, the King has been pleased to appoint Miss Ruth Darwin to be a Commissioner (unpaid) of the Board of Control.

THE inaugural meeting of the Institute of Physics will take place on Wednesday, April 27th, at 6 p.m., in the hall of the Institution of Civil Engineers, Great George Street, Westminster. Sir Richard Glazebrook, K.C.B., President, will preside, and Sir J. J. Thomson, O.M., will deliver an address. Mr. A. J. Balfour is expected to be present and extend a welcome to the institute. Non-members of the institute or of the societies associated with it may obtain tickets of admission on application to the Secretary, 10, Essex Street, Strand, W.C.2.

A COURSE of ten lectures on ante-natal and post-natal child physiology will be given by Dr. W. M. Feldman, in the physiological theatre of the London Hospital Medical College, on Mondays, at 5 p.m., beginning on April 25th, and Dr. Millais Culpin will deliver a course of fourteen lectures on psychoneuroses in the clinical theatre of the hospital on Tuesdays and Fridays, at 5.15 p.m., commencing on May 3rd. Further particulars can be obtained on application to the dean of the college.

A POST-GRADUATE course of lectures and demonstrations will begin at the National Hospital for the Paralysed and Epileptic, Queen Square, on May 2nd, and will be continued on each Monday, Tuesday, Thursday, and Friday till June 24th. Mr. Leslie Paton will give a series of six lectures and demonstrations in neurological ophthalmia, beginning on May 11th, and Dr. Greenfield a course in pathology if sufficient entries are received. Mr. Armour and Mr. Sargent will operate on Tuesday and Friday mornings, or at such other times as may be announced. The fee for the post-graduate course is seven guineas; for the course in ophthalmology, if taken with it, two guineas, and for the course in pathology three guineas. The Fellowship of Medicine's ticket will not admit to these courses.

THE Leicester Medical Society has arranged a course of post-graduate lectures to be given at the Royal Infirmary, Leicester, at 4.45, on Wednesdays, from April 20th to May 18th. Dr. Arthur Hurst will lecture on gastric and intestinal diseases on April 18th and May 4th, Dr. G. F. Still on urinary disorders in childhood and on dietetic causes of disease in infancy and childhood on May 11th and 18th, and Mr. R. C. Elmslie on manipulative surgery on April 27th.

AT a meeting of the Executive Council of the Federation of Medical and Allied Societies on April 5th it was announced that its incorporation had been satisfactorily completed. Sir Berkeley Moynihan, K.C.M.G., C.B., M.S., of Leeds, was elected president, and Sir Malcolm Morris, K.C.V.O., F.R.C.S.E., the Chairman of Council, was elected vice-president. The Federation now has (1) a medical council, (2) a council of allied professions, and (3) a citizens council. Each society is to have a representative on the council appropriate to its professional interests. The British Association of Radiology and Physiotherapy was elected to membership.

DR. DAN MCKENZIE has been elected a Corresponding Fellow of the American Laryngological Association.

A MEETING of the Röntgen Society will be held on Thursday, April 21st, at 8.15 p.m., in the Physics Lecture Theatre, University College, Gower Street, when a paper on a new form of stereo-fluoroscope will be read by Professor A. M. Tyndall and Mr. E. G. Hill, and descriptions and demonstrations will be given of new apparatus. A meeting of the Society is to be held at Manchester on May 6th, when Professor W. L. Bragg will read a paper and Professor A. V. Hill will demonstrate some physiological experiments.

DR. E. RIST has arranged a ten days' advanced course on tuberculosis in Paris for the latter part of May; the subjects to be treated will include artificial pneumothorax, experimental reinfection, the extent to which *x*-ray work has affected ideas regarding the pathology and diagnosis of lung tubercle, etc. One day will be spent at the hospital for surgical tuberculosis at Berck-sur-Mer, and a visit has been arranged to Bligny Sanatorium; visits will be paid also to the Rockefeller Dispensaries, Pasteur Institute, Laënnec Hospital, and other institutions. Further particulars can be had from Dr. W. H. Dickinson, 91, New Bridge Street, Newcastle-upon-Tyne.

ACCORDING to a recent census, the total population of Russia has been reduced by about 10 per cent. The diminution amounts to 45 per cent. in Moscow and 71 per cent. in Petrograd, and is very pronounced in all the cities. In the country districts, on the other hand, it is very slight.

THE King's Fund Policy Committee has just issued an interim report, dated April 4th, 1921, on the policy to be recommended for the preservation of the voluntary system of hospital management and control. Copies of this interim report and of the thirteen resolutions passed by the President and General Council on January 26th last may be obtained from King Edward's Hospital Fund for London, 7, Walbrook, E.C.4.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

"W. A. R.," who is treating a woman of 55 suffering from severe rheumatoid arthritis of one knee, believes that if the joint could be fixed she could get about without pain. Would fixation in plaster, he asks, be of any use in producing ankylosis, or is excision of the joint ever justifiable in such a case? No other joint is affected.

INCOME TAX.

"T. M. C." asks for further advice as to liability in respect of cash coming to his hands after he has sold his share in the practice. His previous answer was published on March 5th, 1921.

*** We are clearly of opinion that he is not liable, and suggest that the inspector of taxes, whose letter he has forwarded, does not appreciate the point. Simply stated, this is that when "T. M. C." ceases to do professional work his income ceases also; what he receives is in respect of past earnings, and he has paid tax on those earnings. Of course, not *specifically* on those receipts, but on other receipts which

were taken as equivalent thereto. The revenue authorities refuse to assess a commencing practice—or incoming practioner—on the basis of cash receipts, holding, reasonably enough, that in the early years these do not provide a sufficient index to the earnings of the practice. The obvious corollary to that proposition is that cash received when the earning has ceased represents the recovery of fees which have already paid tax.

"J. J. M." is an assistant medical officer at an asylum receiving a salary plus emoluments, "not negotiable for cash," valued at £120. He inquires whether he is liable to pay tax thereon.

*** No; the case is covered by a decision of the House of Lords in Smith *v.* Tennant.

LETTERS, NOTES, ETC.

DR. FREDERIC VICARS writes: Apropos of your interesting article on Alexis Soyer, the celebrated chef, the following mot is worth recording: Though his wife was a person of violent temper and gave him many a *mauvais quarte d'heure*, Soyer was devoted to her. On meeting a celebrated member of the Reform Club just after her death, the disconsolate Soyer asked him to suggest an epitaph for her tombstone. "Soyez tranquil," was the prompt reply.

MILK REGULATIONS.

REGULATIONS recently issued by the Food Controller and the Minister of Health continue in force the provisions which are already contained in the Orders of the Food Controller regarding the control of the quality of milk. Licences for the sale of Grade A and Grade A (Certified) milk will in future be issued by the Ministry of Health instead of by the Food Controller, and local authorities will be able to take steps to prevent milk being sold in any area under any of these designations, or "milk" which has been made up from dried milk or condensed milk, without such a licence. Similarly, no milk or cream to which any colouring matter or water has been added must be offered for sale. The licensing of wholesale dealers in milk and the registration of retail dealers will be continued for the present by the Board of Trade as the successor of the Food Controller.

EMETINE IN BILHARZIASIS.

"B. H." writes: Dr. Harkness, in the BRITISH MEDICAL JOURNAL of December 11th, 1920, page 890, writes on the superiority of sodium antimonium tartrate over emetine in the treatment of bilharziasis, mentioning that he was taking, or being given, emetine gr. ½, and that no improvement was noticed. The doses, however, advocated from Egypt have been gr. iij every third day or so, and the smallness of Dr. Harkness's dose will no doubt account for the apparent failure. In my own hands emetine doses of gr. iij every third day has given the best pleasing results; and usually only four have been required—anaemia, urine and general debility quickly clearing up. The immediate after-effects of such a large dose of emetine is sometimes a feeling of nausea and even vomiting, but usually no discomfort is felt in adults; a child of 10 years will easily stand gr. 2½. These remarks are not meant to advocate the use of emetine in place of antimony, which latter has proved its worth in bilharziasis. Certainly one great virtue in emetine is the simplicity of administration—intramuscular into the deltoid and lumbar region.

THE TREATMENT OF PNEUMONIA.

WE have received from Dr. R. W. Burkitt, F.R.C.S.I. (Nairobi), a communication in the course of which he says: For some years past I have treated acute pneumonic fever on the following general principles, and I have now successfully treated 250 cases in this way, chiefly Europeans, but including Asiatics and a few natives of Africa. I have not only never lost one who came under treatment early, but, provided I saw my patient within the first twenty-four hours of his fever, I have had no anxiety as to his recovery. I should not advise anyone to adopt the method of treatment unless he means to be thorough—half measures are of little value. Briefly, my principles of treatment are in this order: (1) The temperature is kept under 101°; (2) severe purgation is employed during the first twelve to twenty-four hours, afterwards a daily motion; (3) acidosis is avoided by giving potassium citrate: (4) enormous quantities of water are drunk; (5) absolutely no nourishment of any kind whatever is allowed until the fever is over, the tongue clean, and the patient hungry; (6) no stimulants of any kind are allowed. The keeping of the temperature under control, in this country where we have a big evaporation, is effected by the patient being at once put on a waterproof sheet, absolutely naked except his feet, the whole body being kept continuously wet and placed in a draught so as to get the maximum evaporation. The feet are kept warm with socks and a hot bottle; this makes the patient comparatively comfortable. Patients only complain of the treatment at first; in a few hours they get to see the value of it. There must be no half measures here—thoroughness always saves life. When the temperature is 100° the patient is allowed a sheet, as it tends to make him sleep, but if his temperature goes up much it is taken away. Sometimes with a sheet the temperature may run up 1° to 2°. When it goes below 100° he is allowed further clothing, but he is treated according to the temperature at the time. As to purging, there must be degrees of severity according to the fullbloodedness of the patient and the amount of toxaemia present. In a fullblooded toxaemic person, near the beginning, I help the purging by at once bleeding to the extent of a pint or so. This gives immediate relief to the right heart and to the whole system in a lessening of toxins. If done late bleeding does harm, the reason probably being that the antitoxins then made are bled out. In a case not seen until late on, heavily intoxicated and blue, I think the best thing is to purge severely, but not to bleed. I purge with calomel and Epsom salts for the first twelve to twenty-four hours only, and afterwards I secure a liquid motion daily with a light saline.

Acidosis is common in pneumonia, and, therefore, all my patients receive a teaspoonful of potassium citrate three times a day, although some require far more. It is impressed on every patient that his life depends on the amount of cold water he drinks; he is kept frequently urinating. I have found that the giving of any food during any fever (even a little diluted milk) is definitely prejudicial until the fever is finished, the tongue clean, and he is hungry. I have kept a fever patient as long as six weeks on pure water with none but the happiest results.

CLIMATE OF THE RIVIERA.

DR. JULIAN TAPLIN writes with reference to two topics touching the climate of the Riviera. He has been residing at Saint Raphael, on the main boulevard, and complains that, though it is the main route to the Eastern Riviera, the road is not kept cleansed and watered, so that there is a great deal of dust. The other point is that he desires to hear of some place within easy reach of the Riviera, which would be suitable for a case of chronic pulmonary tuberculosis during the summer.

THE RUPEE EXCHANGE.

"HAKIM" writes: The rupee, which was worth two shillings and elevenpence a year ago, is worth only one shilling and threepence to-day, and its value is falling steadily. No prospects of granting of exchange compensation are held out, and twenty rupees may soon be equivalent to one pound sterling. Passages to and from India are all quoted in sterling, and as the rupee falls in value so does the cost of passages in rupees rise. A second class return passage from India now costs just over two thousand rupees. It is possible for a bachelor to save enough from his salary to pay for his return passage, but it will use up all his savings. With the rupee at sixteen to the pound and likely to go to twenty, any man who contemplates matrimony must reconcile himself to perpetual exile.

AN ELECTRIC THERMOSTAT.

THE Wild-Barfield electric thermostat appears to be constructed on a new plan; a capsule filled with a volatile fluid is made, by its expansion, to switch off a part of the heating element as soon as the full temperature is reached. Afterwards the full current is switched on and off intermittently, so that a temperature is maintained steadily at the desired height. The device, which can be set for temperatures up to 400° F., is made by Automatic and Electric Furnaces, Ltd., 281, Gray's Inn Road, W.C.1.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 34, 35, 36, 37, and 38 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 32 and 33.

THE appointment of certifying factory surgeon at Burton-upon-Trent (Stafford) is vacant.

"CAPT. R.A.M.C." has omitted to enclose his name and address.

REDUCTIONS of approximately 20 per cent. in the price of motor covers and of 15 per cent. in that of inner tubes are announced by the Stepney Company.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line...	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.